



UCL

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**Social Aspects of
Industrial Symbiosis
Networks**

Appendices

A Thesis submitted in fulfilment of the
Degree of Doctor of Philosophy

**Bartlett school of Graduate Studies
University College London**

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Appendix A

Fieldwork Documentation

1. INTERVIEW RECORDS: LIST OF INTERVIEWEES

KALUNDBORG

Interviewee	Position	Date	Recording Code	Transcript Code
Noel B. Jacobsen	Lecturer in Roskilde University	24/10/ 06	NJ Kalundborg	NJ Kalundborg
Sven-Ole Toft	Statoil Economic Manager	24/10/ 06	ST Kalundborg	ST Kalundborg
Jorgen Christensen	Former Director of the Industrial Symbiosis Centre	26/10/ 06	CH1 Kalundborg CH2 Kalundborg	CH1 Kalundborg CH2 Kalundborg
Ethnographic diary		24-26/10/06	-----	Erase una vez...Kalundborg

NISP

REGIONAL PROGRAMMES

Interviewee	Position	Date	Recording code	Transcript Code
NISP East of England Workshop- St Neots		20/10/2006	-----	NISP East of England Workshop- St Neots
Nigel Holmes	SISP Scotland	30/10/ 06		SC1 NISP SC2 NISP
Paul Mather	NISP South-West	1/11/ 06	A0019	SW NISP
Nick Houldsworth Mick Fanning	NISP London	7/11/06	A0020	LD NISP
Terry Lowdon	NISP Yorkshire and Humber Technology manager Programme coordinator		A0021_1 A0022_1	HB1 NISP HB2 NISP
Andrew Hopkins	NISP Wales	13/11/06	A0025_1	WL NISP
Dave Pearson Jo Randall NISP West Midlands	Programme coordinator	14/11/08	NISP WEST-MIDLANDS	NISP WEST-MIDLANDS

Ewan Mc Donald	Programme coordinator North West	12/05/08	----	NISP NORTH WEST
Trevor Knipe	NISP Northern Ireland Programme coordinator	22/05/08	A0036 A0037	
Prof. Paul Ekins	IS Chairman	26/03/10	--	

COMPANIES

Interviewee	Position	Date	Recording code	Transcript Code
Paul Whitby	CORUS Environmental Manager	29 th November 06	A0023 A0024_1	COR1 CO COR2 CO
Keith Palmer	UK COAL company	12 th December 06	A0027	CA CO
Peter Jones	BIFFA CEO manager	19 th December 06		BIF CO

SAGUNTO/ VALENCIA

Interviewee	Position	Date	Recording code	Transcript Code
Alvaro Torregrosa	Manager (CEMENTVAL)	19/05/2008	DW_A0034 DW_A0035	CEV
Julio Leal	Líder de medioambiente y seguridad (PILKINGTON)	19/05/2008	No recording	PK
Ana Lendoiro	Environmental Manager Technical ARCELOR MITTAL	12/07/2008	AM	AM
Andres Ballester	Production Manager and Environmental Manager (THYSSEN)	10/07/2008	SOLMED GALMED (1-5)	TY
Jose Angel Perez Romualdo	Environmental Manager Fertiberia	08/07/2008	FT	FT
Tomas Izquierdo	Environmental and Quality manager	09/07/2008	FD	FD

	Ferrodisa			
Raul Lanemegrand	Environmental and Quality manager Asland	15/07/2008	AL	AL
Jaume Garcia	Environmental and Quality Technician Bossal	10/07/2008	BS	BS
Miguel Domenech	Ex regional Ministry of Employment and Industry	08/07/2008	PC	PC

2. Interview Outline: Kalundborg

Interview Outline

Case Study: Kalundborg

Date:

Interviewee:

THE PROCESS

How and when was Kalundborg symbiosis network initiated? What were the key factors that lead to development of the network?

What were the initial drivers of the network? How do they have evolved?

How and why did the companies started to consider taking part in the network? How they come up with the idea of collaboration?

Can you identify different phases on the process of development of the symbiosis.

THE STRUCTURE

How is the network in Kalundborg organised?

What elements have been crucial in the further development of the network?

Could you please tell me about the micro-dynamics of the networks?

How companies communicate with each other?

How are new companies attracted to the area?

How are new projects initiated?

STRATEGY DESIGN

Is there any strategically planning of the network?

What are the main challenges facing the implementation of the network?

What is the role of the symbiosis centre within the network?

What kind of support do they provide to the companies?

THE MAIN ACTORS

What actors are involved in the network?

How is the relationship between companies and public bodies (local authorities, environmental agency, etc...)?

What is the level of involvement of the different actors?

What instruments are in place to favour the interaction between actors? (Companies, regulatory bodies, municipalities, etc...)

What is the profile of the companies that are engaged in the network? Has it evolved over the years?

Trust has been highlighted as playing an important role in the development of the kalundborg network, but How is trust generated?

SPATIAL SCOPE

What role does geographical distance play in the implementation of Industrial ecology and symbiotic exchanges in Kalundborg?

Is it mainly a local-basis system or it has been extended to larger areas?

3. Interview Outline: Sagunto

CUESTIONARIO DE REDES MEDIOAMBIENTALES INDUSTRIALES

Datos Generales de la empresa

Diagrama de flujo del proceso productivo

Principales aspectos medioambientales de la actividad

- Volumen de emisiones a la atmósfera, consumo de materias primas, producción de residuos, consumo de agua y volumen de aguas residuales generado.
- Ruido, paisaje
- Otros aspectos significativos

Medidas de minimización y control de la contaminación

- Medidas de prevención
- Medidas de corrección (end of pipe)

Política medioambiental y posicionamiento de la empresa

- El cumplimiento de la Normativa medioambiental (aplicación de la IPPC, si corresponde) y la mejora medioambiental en la empresa
- Gestión medioambiental y ventaja competitiva
- La motivación de la mejora medioambiental en la empresa

Proceso de toma de decisiones medioambientales

- Cuál es el procedimiento de toma de decisiones medioambientales en la empresa
- Proceso de evaluación de proyectos medioambientales
- Colaboración entre departamentos
- Colaboración dentro del grupo empresarial

Las posibilidades de intercambio y colaboración medioambiental

Agentes principales de negociación

- Relación con la administración
- Relación con comunidad local
- Relación con otras empresas

Los ámbitos de la colaboración con los diferentes agentes

- desarrollo tecnológico e innovación
- Gestión de la calidad

4. Interview Outline: NISP

Case Study: NISP

Date:

Interviewee:

THE PROCESS

How and when was NISP initiated in your region? What were the main leaders of the project?

What were the initial goals of the programme? How do they have evolved?

What is your working concept of Industrial Symbiosis?

What did the NISP foresee as the potential of the initiative for the region?

THE STRUCTURE

What is the role developed by NISP and what are the means and general working procedures of the NISP in the region?

Why have the NISP opted for a regional approach and how is the relationship between the different regional programmes coordinated?

What is the main structure of the NISP in the region?

STRATEGY DESIGN

How is the NISP regional strategy designed? What actors are involved in the design?

How are the concrete features/ needs of the region analysed?

How are these regional “peculiarities” integrated into the strategy design process?

What are the main challenges your region is facing in implementing the NISP?

THE MAIN ACTORS

Number of NISP members

Levels of implications of regional members: types

Is there a “core” structure of participating members?

What is the level of involvement of the different actors in NISP? How do manage to involve them? (Companies, regulatory bodies, municipalities, etc...)

How do you manage to gain first access and keep long-term relationships with the different agents?

What kind of communication channels do you use to contact and keep the track of companies and other relevant actors?

What is the profile of the companies that are more likely to agree to collaborate in the programme?

SPATIAL SCOPE

What role does geographical distance play in the implementation of Industrial ecology and symbiotic exchanges?

Why NISP has been developed on regional basis?

Benefits of NISP in comparison to Eco-Industrial Park approach

TECHNOLOGY AND KNOWLEDGE TRANSFER

What role does NISP play in promoting technological and knowledge transfer?

What role does NISP play in promoting or developing new cleaner technologies?. Discuss the implications of NISP in promoting cleaner versus end-of-pipe technologies

Discuss the potential role of NISP as knowledge bank

Is NISP a learning organisation? What mechanisms, if any, have been implemented to generate and retro-fit learning into the network?

OUTCOMES

Number of synergies proposed to companies: process of identification, process of communication and negotiation

Synergies achieved: volume/weight, material/energy

The cost/benefit analysis process, how important is the “green” aspect in adopting a synergy?

Failure of implementation of technically and economically synergies

BENEFITS

What main benefits have been achieved so far?

What effects or contributions of the NISP have been more relevant?

What is the relationship between the expected outcomes and the outcomes actually achieved?

The process of evaluation of the regional outcomes

BARRIERS

What are the main difficulties faced to achieve the outcomes?

Is there any significant regulatory barrier that hinders the potential development of NISP?

What are the main technological barriers? How do you deal with quality and reliability issues of the symbiotic exchanges?

Are there any relevant social or cultural barriers to implement NISP in the region?

How do you overcome these barriers?

FUTURE SCENARIO AND PROGRESS

What is the potential contribution of IE to sustainable development of the region?

What is the expected evolution of the NISP (goals, programmes, scope, tasks,...)?

Do you aim to integrate NISP into the policy strategy of the region?

How does NISP fit into the context of sustainable development, competitiveness and globalisation?

What other strategies and approaches can complement the role of NISP?

The NISP strategy versus Eco-Industrial Park development

Final remarks.

The treatment of data follows the UCL-Data Protection Procedures.

Appendix B

Kalundborg: Analysis outputs

QUALITATIVE ANALYSIS

1. Hermeneutic Unit- All Objects

HU: KALUNDBORG6

File: [R:\PHD\KALUNDBORG6.hpr5]

Edited by: Super

Date/Time: 10/05/2010 17:10:26

List of all objects

HUs

===

KALUNDBORG6

Primary Docs

=====

P 1: Background Ethnographic diary

P 2: CH1andCH2 Kalundborg.doc

P 3: ST Kalundborg

P 5: NJ Transcript.rtf

P 6: NJ Transcript.rtf

Quotations

=====

2:1 J. Christensen has been pointe.. (8:8)

2:2 symbiosis as a good idea, an a.. (10:10)

2:3 a good solution at one concret.. (10:10)

2:4 collaboration and symbiosis, w.. (10:10)

2:5 what defines "environmental" a.. (10:10)

2:6 they all told me you have to s.. (73:73)

2:7 of course it is a question of .. (90:90)

2:8 our definition have been for a.. (90:90)

2:9 we have been careful abut choo.. (90:90)

2:10 .I talk about industrial symbio.. (90:90)
2:11 collaboration is the first wor.. (90:90)
2:12 so different is also important.. (90:90)
2:13 the mutual benefit is also ver.. (90:90)
2:14 is a win-win (90:90)
2:15 that is something that pays of.. (90:90)
2:16 Then we face here the problem .. (91:91)
2:17 22 or 23 projects (91:91)
2:18 Then we face here the problem .. (91:91)
2:19 This is a very conservative fi.. (91:91)
2:20 the municipality is participat.. (91:91)
2:21 they are not involved neither .. (91:91)
2:22 we have also collaboration wit.. (91:91)
2:23 They exist with the purpose of.. (91:91)
2:24 The principles are “someone wa.. (92:92)
2:25 So, that is also a criterium a.. (92:92)
2:26 Pragmatically, those which at .. (94:94)
2:27 given the regulation or the re.. (95:96)
2:28 if we, for instance, speak abo.. (98:98)
2:29 so therefore you cannot define.. (98:98)
2:30 .Gyproc, a smaller company act.. (99:99)
2:31 total energy industry in Denma.. (99:99)
2:32 It is a hypothetical situation.. (101:101)
2:33 the refinery is also a big pla.. (103:103)
2:34 then one company that did the .. (103:103)
2:35 And then the municipality of K.. (103:103)
2:36 We have a small company that j.. (108:108)
2:37 And then we have the waste han.. (108:108)
2:38 three types of projects: Recyc.. (109:113)
2:39 here are two types of projects.. (115:115)
2:40 : those where both the donor a.. (115:115)
2:41 there are some where the recei.. (115:115)
2:42 there is two projects that inv.. (115:115)
2:43 And then we have a especial pr.. (115:115)
2:44 When you look into the way it .. (115:115)
2:45 This is how Kalundborg looked .. (116:137)
2:46 There are many projects which .. (138:138)
2:47 this is a non-project made by .. (140:140)
2:48 All the journalists we have ta.. (140:140)
2:49 When the people from Gyproc ma.. (140:140)
2:50 They see it as a one project, .. (140:140)
2:51 The symbiotic consciousness sp.. (142:142)

2:52 Kalundborg is an early example.. (142:142)
2:53 The petrochemical industry ins.. (142:142)
2:54 why do you think this happen i.. (144:144)
2:55 ut anyway we had large industr.. (144:144)
2:56 There was an economic incentiv.. (144:144)
2:57 There were no legal barriers w.. (144:144)
2:58 And then, and this is focussin.. (144:144)
2:59 Why was the communication good.. (146:146)
2:60 the communication between indu.. (146:146)
2:61 among the group there are no c.. (146:146)
2:62 they are not shy, the managers.. (146:146)
2:63 here I already I have been on .. (146:146)
2:64 In our country, in Scandinavia.. (146:146)
2:65 and I always remember the stea.. (146:146)
2:66 if we have been able to succes.. (146:146)
2:67 I think that this project was .. (146:146)
2:68 and it is also necessary that .. (146:146)
2:69 At certain time, we had 300 bu.. (146:146)
2:70 We have a long what I call the.. (148:149)
2:71 There was a period when we got.. (149:149)
2:72 here we have saved ground wate.. (151:152)
2:73 of course the economy this is .. (152:152)
2:74 the problem is how could we ev.. (152:154)
2:75 so we sat down and gave oursel.. (152:152)
2:76 But it was difficult to see wh.. (152:153)
2:77 But it was difficult to see wh.. (152:152)
2:78 savings would be at least over.. (153:153)
2:79 at that time we had we thought.. (153:154)
2:80 The payback time we also that .. (154:154)
2:81 District heating things are lo.. (154:154)
2:82 I think the average I think th.. (154:154)
2:83 participants must fit but they.. (154:154)
2:84 participants must fit but they.. (154:154)
2:85 it is important that the proje.. (154:154)
2:86 so you can force them to join .. (154:154)
2:87 has to be short physical geogr.. (154:154)
2:88 but much more important is tha.. (154:154)
2:89 you have to have some kind of .. (154:154)
2:90 communication is much more imp.. (154:154)
2:91 The critical path is the commu.. (154:154)
2:92 he analysed it and said you ha.. (154:154)
2:93 we talked about bottom up and .. (154:157)

2:94 the employees felt the differe.. (156:157)
2:95 ou have to compensate to try t.. (157:157)
2:96 Same thing is a general thing .. (157:158)
2:97 I was also at first symposium,.. (158:160)
2:98 I try to do it Kalundborg is a.. (160:160)
2:99 I'm sure we can You could imme.. (163:163)
2:100 I think I just said... regulat.. (164:165)
2:101 but there are barriers also pr.. (175:175)
2:102 es, definitely, and you would .. (181:181)
2:103 yes, it is what they say at th.. (187:187)
2:104 well, yes,...it is not I think.. (199:199)
2:105 sometimes you would hear peopl.. (199:199)
2:106 it has been economically attra.. (205:205)
3:1 the will of the managers to do.. (9:9)
3:2 the experience is driven by co.. (9:9)
3:3 the main stream we are contrib.. (18:18)
3:4 given to a fertiliser company .. (22:22)
3:5 and compare to the alternative.. (26:26)
3:6 It's from business point of vi.. (30:30)
3:7 starting back in the early or .. (32:32)
3:8 .but if you look at...every pr.. (34:34)
3:9 periods... S: yeah...where you.. (35:36)
3:10 .we have one big advantage in .. (40:40)
3:11 so, it's some big companies he.. (42:42)
3:12 o, it's some big companies her.. (42:42)
3:13 still I think it depends very .. (42:42)
3:14 but to have the idea that is d.. (46:46)
3:15 yes, in this early period wher.. (48:48)
3:16 T: So, it was actually the inf.. (49:50)
3:17 I think every single, every pr.. (52:52)
3:18 .but we don't know each other'.. (52:54)
3:19 especially I think it has alwa.. (54:56)
3:20 If you look at some of the pro.. (58:58)
3:21 And in the nineties it was not.. (60:64)
3:22 Economy is one of them but peo.. (66:66)
3:23 Only our fertiliser and Novo h.. (68:68)
3:24 The process was so that we had.. (70:70)
3:25 Yea...for some of them. Normally.. (72:72)
3:26 so the waste water treatment w.. (74:74)
3:27 it is now established a networ.. (76:76)
3:28 It is a good opportunity to me.. (78:78)
3:29 We write it into the contract... (80:80)

3:30 I think that all those compani.. (82:82)
3:31 I think that all those compani.. (82:82)
3:32 I think that thinking in that .. (84:84)
3:33 The power plant and Statoil we.. (90:92)
3:34 I mentioned, there are ideas t.. (94:94)
3:35 More mental than technical I w.. (98:98)
3:36 to know a little about each ot.. (100:100)
3:37 But when you are busy focussin.. (100:100)
3:38 Not as a formal network becaus.. (104:104)
3:39 When we starting environmental.. (108:108)
3:40 yea, for companies starting fr.. (110:110)
3:41 I don't think it is a big port.. (112:112)
3:42 Of course economy is a barrier.. (114:114)
3:43 But so you think that symbioti.. (115:116)
3:44 One barrier for solutions coul.. (116:116)
3:45 And then another barrier is re.. (116:116)
3:46 Yes, I think we could see it b.. (122:122)
3:47 yea, to some extent they try t.. (124:124)
3:48 the collaboration with the aut.. (124:124)
3:49 From time to another, for exam.. (126:126)
3:50 Of course if we see that the l.. (126:126)
3:51 Of course we would have an int.. (126:126)
3:52 Yea, it is but yea, but you ca.. (126:126)
3:53 The other barrier with communi.. (126:126)
3:54 but as manager of the company .. (126:126)
3:55 It is important that the man w.. (126:126)
3:56 I think it is important to a c.. (128:128)
3:57 And a good business and econom.. (128:128)
3:58 And I think yes that are main .. (128:128)
3:59 Yep, because you have made som.. (130:130)
3:60 yea....may be not by earning mor.. (134:134)
3:61 I have no doubt that the steam.. (134:134)
3:62 So, it strengthens their busin.. (134:134)
3:63 It is to see that it is possib.. (136:136)
3:64 the Kalundborg case is that ha.. (138:138)
3:65 yes, because still when you go.. (140:140)
3:66 And then again small town with.. (142:142)
3:67 But again even in a big town y.. (144:144)
3:68 I think as start is a little b.. (148:148)
3:69 at each plant at Asnaes, at No.. (150:150)
3:70 But you could always go back t.. (154:154)
3:71 So, and of course if the risk .. (154:154)

3:72 there, there would be a Novo t.. (154:154)
3:73 I think the market with high c.. (156:156)
3:74 One thing that could prohibiti.. (156:156)
3:75 Not very much but I would say .. (158:158)
3:76 it has been tried to make a bi.. (160:160)
3:77 but again a network is somethi.. (162:162)
3:78 I don't think you can spread i.. (162:162)
3:79 think you didn't develop the n.. (162:162)
3:80 ...here you have some companies .. (162:162)
3:81 so every time you establish ne.. (164:164)
3:82 and also to make the projects .. (166:166)
3:83 and also to make the projects .. (166:166)
3:84 So I am sure that it would com.. (166:166)
3:85 our processes have changed so .. (168:168)
3:86 No, I don't think so...because t.. (168:168)
3:87 yea, yea...or you have to help t.. (170:170)
3:88 Again it depends on how the co.. (174:174)
3:89 and sometimes you have here in.. (176:176)
6:1 there are a lot of very nice s.. (14:14)
6:2 to dig into the kalundborg cas.. (14:14)
6:3 .it started more or less like .. (14:15)
6:4 it was because all of them wan.. (21:21)
6:5 more the access to water, you .. (29:30)
6:6 of course you can say a number.. (30:30)
6:7 it takes time. But it is diffi.. (34:34)
6:8 it is more about commitment to.. (38:38)
6:9 The question of will is just a.. (42:42)
6:10 that's interesting question to.. (47:47)
6:11 to coordinate...primarily the .. (61:61)
6:12 That was one of the important .. (66:66)
6:13 also in Denmark the regulation.. (90:90)
6:14 like any other places, sometim.. (92:92)
6:15 yes, there are a lot of nation.. (100:100)
6:16 yes, except for Gyproc, it dep.. (102:102)
6:17 in Denmark that are obliged to.. (102:102)
6:18 the environmental agency? no, .. (107:107)
6:19 yes created a good relation fo.. (110:110)
6:20 that's a difficult one to over.. (114:114)
6:21 post treated material you don'.. (117:117)
6:22 as part of their environmental.. (120:120)
6:23 they sell it today the environ.. (124:124)
6:24 It has stayed rather stable, t.. (128:129)

6:25 yes, it is nothing, it's nothi.. (133:133)
6:26 when you goes through the plan.. (133:133)
6:27 they talk very much about inst.. (134:134)
6:28 yes, that is exactly,...so we .. (146:146)
6:29 yes, if you are working in the.. (150:150)
6:30 yes, if you are working in the.. (150:150)
6:31 no, we already had the relatio.. (159:159)
6:32 no, we already had the relatio.. (159:159)
6:33 in Kalundborg it is not a prob.. (163:163)
6:34 in some way, yes that's right,.. (173:173)
6:35 you would not end up with havi.. (177:177)
6:36 no, no they are not, never, ne.. (190:190)
6:37 yes, that is so...what I mean .. (194:194)
6:38 The companies meet one another.. (197:197)
6:39 .it is more like take industri.. (201:201)
6:40 yyyeees, ..what kind of chall.. (208:208)
6:41 yes, I know what you mean, but.. (222:223)
6:42 ok, but sector pharma company .. (227:227)
6:43 no, it is important in which m.. (231:231)
6:44 yes, there have been absolutel.. (274:274)
6:45 I think that is the best way t.. (289:289)
6:46 in priorities over the years l.. (292:292)
6:47 eh and it is as we talked abou.. (292:292)
6:48 people have changed and that i.. (292:292)
6:49 industrial symbiosis is fragil.. (292:292)
6:50 yes, methodology, ah, it is a .. (298:298)
6:51 neither there is in Denmark as.. (313:313)
6:52 not to attract but perhaps to .. (317:317)
6:53 .in ten years it depends on th.. (322:322)
6:54 yes, I think so it is far inst.. (326:326)
6:55 not necessarily, they may be i.. (329:329)
6:56 of course, the more you expand.. (346:346)
6:57 there are databases in every u.. (354:354)
6:58 it is more a question of sayin.. (361:361)
6:59 and also you have to look at t.. (365:365)
6:60 yes, like fly ash, foe example.. (373:373)
6:61 I guess in different locations.. (373:373)
6:62 yes, exactly and there may be .. (377:379)
6:63 yes, you have to be very clear.. (385:385)
6:64 Yes well, I think it is very.... (406:406)
6:65 in general on the one hand tho.. (410:411)
6:66 that very true...and that is w.. (436:436)

6:67 depending on the national cont.. (453:453)

6:68 yes, there have been some exch.. (457:457)

Codes

=====

80's driver regulatory requirements {1-0}

90's driver regulation and technical solutions {1-0}

A project managed by the companies {1-0}

Accumulated savings {1-0}

Actors {2-0}~

"The companies involved in the IS network in Kalundborg have integrated sustainability at the core of the corporate strategy. They occupied top positions on the Dow Jones Sustainability index, although IS is not a common practice in all the locations of the company."

Adaptability {4-1}

An incentive for companies to stay in the region {1-0}

Associasionism culture/ collaboration culture {1-2}

associations {1-0}

Attraction of other companies into the network {1-0}

Average payback period {1-0}

awareness of the symbiosis {1-2}

Barriers {8-1}

Basic knowledge of each other's processes {1-2}

Benefits of formal network {1-0}

Best alternative {5-0}

Bottom-up vr Top Down {1-0}

Boundaries of the network {1-0}

Business perspective {1-0}

by-product networks {1-0}

By-products {1-0}

Calculation of economic benefits {3-0}

Calculation of economic savings {2-0}

Challenge people to think in the IS to find a solution {1-0}

CHALLENGES {0-13}

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Changes in priorities {1-0}

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Changes on the competitive environment of the companies {1-1}

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Collaborate at the early stages of the idea development {1-0}
Collaboration {4-0}
Collaboration on a project brought more projects {2-2}
Collaboration takes time and resources {3-0}
Commitment to an idea {3-2}
communication and trust requires strong social relationships among members {1-3}
communication vr technology {2-2}
Communication was good {3-5}
Companies must fit {1-4}
Compensate for time {2-0}
Competitive environment {1-4}
Connection with Agenda21 {1-0}
Context {4-2}
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cooperation in other areas {1-0}
Coordination and timing {1-1}
Credibility {1-0}
Critiques to Kalundborg {2-1}
CRS {1-0}
Cultural elements {2-4}
Culture of cooperation {2-8}
Definiton of good behaviour, embedded rules {1-0}
Dependency {2-3}
Dependency is not a problem in Kalundborg {1-1}
Differencies between cluster theory and IS networks {1-0}
Different payback periods {1-1}
Difficult projects {1-2}
Difficult to calculate the economic savings {2-0}
Difficulties of SMEs to involve in IS projects {1-0}
Difficulty to attract companies based on IS exchanges {2-1}
Difficulty to generate new ideas {2-1}
Direct competitors {1-0}
Diversity {1-2}
Drivers for the IS exchanges {14-0}
economic and environmental benefits {5-0}
Economic constrains {1-0}
economic incentive {8-0}
Education system {1-1}
EMERGENCE {2-8}
Endogenous idea {1-4}
engagement {2-2}
Evolution of the network {8-0}

EXCHANGE CONDITIONS {0-0}
 External projects {3-0}
 Flexibility {2-0}
 formalisation of exchanges in contracts {1-0}
 fragility {2-0}
 Frequent communication {3-4}
 Generation change problem {3-1}
 Generation of ideas {1-0}
 Give signals from top management {1-0}
 Green accounting {4-0}
 Green champion {6-2}
 Green taxes {2-0}
 Having time {1-1}
 Heuristics of IS exchanges {2-0}
 Homogeneous by-products {1-0}
 How is the environmental problem framed and rules of the companies to integrate it {2-0}
 How to build up communication {2-12}
 How to promote EIP {1-1}
 Important factors that have favoured the symbiosis {4-18}
 Improve satisfaction of employees {1-0}
 Improving eco-efficiency of the projects {1-0}
 Increase of dependancy {1-3}
 Independent projects {3-3}
 Industrial symbiosis as bottom-up {1-1}
 informal vr formal network {4-0}
 Innovation {3-0}
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 Internal projects {1-0}
 Investments {3-0}
 Involve different levels of the hierarchy {2-1}
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 IS policy framework {3-0}
 IS thinking is introduced in the company's routines {2-0}
 It depends on the people {2-0}
 It has not been a problem in the practice the increase of dependency {1-3}
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Joint problem solving {2-0}
Kalundborg as a practical and working example {1-0}
Kalundborg as model {3-0}
Knowledge of the other companies {2-4}
large industries in limited geographical distance {1-1}
Leadership {4-4}
Learning to collaborate {2-7}
Lessons from Kalundborg {1-0}
License to operate {5-0}
Local bridges {1-0}
Low priority given to by-products and waste within the strategy of the company {3-0}
Maintain the interest {1-1}
Managers were acquainted {2-11}
Markets the company members are operating in {2-0}
Mature networks {4-4}
members of the network {7-0}
Methodological issues {4-0}
More competition increases the need for smart solutions {1-1}
More mental than technological innovation {1-0}
Most of the ideas and projects have been generated inside the network {1-2}
Mutual benefit {1-2}
Negotiation of contracts {5-0}
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Network and context {1-0}
New potential projects in Kalundborg {2-0}
No access barriers {1-9}
No direct competitors {3-2}
No intervention of a third party or authority {1-1}
No legal barriers {1-1}
Novo industry {1-0}
Number of projects in the network {3-0}
Open minded and non secretive managerial style {1-5}
operation of the network {1-0}
Optimal solutions {6-0}
Other case studies in Denmark of industrial symbiosis {1-2}
Other examples of a IS development {1-2}
Past history of cooperation {1-1}
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Possibility to develop the kalundborg model somewhere else {4-0}
Possibility to go back to more standard solutions {2-1}
PROBATION {0-0}
Problems in calculating the economic benefits {1-0}
Projects that fail to realise {1-1}
Projects were chosen ultimately because they helped to save costs {1-0}
Realisation of the idea {1-1}
Refinery {2-0}
Regional, national and international connexions {1-0}
regulation as barrier and driver {3-0}
Regulators {2-0}
Relationship with the regulators {6-0}
relevance of IS exchanges in relation to waste management {1-0}
Resources {1-0}
Restructuration and the evolution of IS {1-0}
Risk {2-1}
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Rotterdam harbour {1-0}
Savings and environmental benefits {1-0}
Savings in environmental management costs {1-0}
Savings per year {1-0}
Self-driven project {4-6}
Semantics of IS {3-0}
SHARED PROBLEM {0-2}
Short geographical distance {3-4}
Short mental distance {2-6}
shows the will to go beyond words {2-0}
Size of the company {1-0}
Size of the network {2-0}
small town {2-3}
SME has less resources {1-1}
SME vr big companies {1-0}
SME's involvement {2-2}
Social vr technological innovation {1-0}
Soilrem {1-0}
some environmental investments will never pay back {2-0}
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Specifications in contracts {1-0}
Spontaneous {3-2}
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Survival of the network in the long term {1-1}
Sustainability is embedded in the technical education {1-0}

Sustainability leadership {1-0}
symbiosis {1-0}
Tacit rules and norms {2-0}
Taxation on energy {4-0}
Technical capability of SMEs {1-0}
The "spirit" of IS {1-0}
the collaboration with the aut.. {1-0}
The culture of waste exchange {2-1}
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The electricity market {1-0}
The engineering approach to IS {1-0}
The environmental profile of the companies {3-0}
The future of Kalundborg {4-0}
The importance of communication {1-0}
The institutional framework of IS {1-0}
The life-cycle of a project {2-0}
The meaning of profitability {7-0}
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The problem to create trust in large networks {1-0}
The process {9-0}
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The role of regulation {4-0}
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The role of the municipality {3-0}
The role of the waste handling company {2-0}
The role of trust {3-2}
The sense of community between companies {1-2}
The size of the community {2-2}
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transaction costs {1-0}
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Waste handling company {1-0}
Waste in the overall strategy of the company {2-0}
Waste streams {3-0}
Water shortage {3-2}
We learned a lot about each other {1-0}
well structured civil society {1-0}

Why communication was good {1-1}
Why did it happen in Kalundborg {3-0}
Widespread of the Kalundborg model within the different company plants {1-0}
Widespread of the project {1-0}
Will and choice {7-3}
Willingness to cooperate {1-4}
win-win {1-0}
working across the fence {2-0}
Would the symbiosis have realised in other circumstances/ {1-1}

Memos

=====

ME - 22/04/09 {1-Co} - Super

The institutionalisation of the network may help to keep the network running even when there are changes in the people that run the companies

ME - 22/04/09 [1] {1-Co} - Super

The collaboration process may take time. Companies have to learn from each other and learn to work together and this takes times and resources, there needs to be a will to cooperate.

However, collaboration helps to build up routines and norms that can be used later on on other projects. So, once these routines are in place transactions costs are dramatically reduced

ME - 22/04/09 [2] {1-Co} - Super

The green accounts can be a tool, but new ideas need to be generated and it doesn't seem that the green accounting has helped in this direction

ME - 22/04/09 [3] {1-Co} - Super

IS exchanges only represents a small portion of the waste generated by the company but they introduce a new way of thinking of waste and by-products. Possibilities within the IS are first examined before other management alternatives are considered.

ME - 23/04/09 {1-Co} - Super

IS projects do not necessarily involve a higher risk than an ordinary business project, although in some cases, if they include innovation or physical infrastructures it may pose a risk, but there is always the possibility to go back to the standard solution. Here also the question of trust plays a role in reducing the risk, as companies are expecting a cooperative and fair play by the rest of the companies.

Code Families

=====

BARRIERS (7)

KEY ELEMENTS (24)

REGULATORY AND INSTITUTIONAL FRAMEWORK (25)

Network Views

=====

BELIEFS AND VALUES (0)

CHALLENGES (25)

COMMUNICATION (17)

EMBEDDEDNESS (0)

EMERGENCE (23)

EXCHANGE CONDITIONS (15)

PROBATION (6)

SOCIAL MECHANISMS OF CONTROL (0)

SUCCESS FACTORS (33)

TRUST (19)

Code-Links

=====

Associasionism culture/ collaboration cu.. <is associated with> Open minded and non secretive managerial..

awareness of the symbiosis <is associated with> Green champion

CHALLENGES <is associated with> Adaptability

CHALLENGES <is associated with> Dependency

CHALLENGES <is associated with> Different payback periods

CHALLENGES <is associated with> Difficult projects

CHALLENGES <is associated with> Difficulty to attract companies based on..

CHALLENGES <is associated with> Increase of dependancy

CHALLENGES <is associated with> it takes time

CHALLENGES <is associated with> Mature networks

CHALLENGES <is associated with> SME's involvement

CHALLENGES <is associated with> Survival of the network in the long term..

CHALLENGES <is associated with> Would the symbiosis have realised in oth..
 CHALLENGES <is part of> Barriers
 CHALLENGES <is part of> Risk
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 Communication was good <is cause of> Managers were acquainted
 Communication was good <is part of> Frequent communication
 Competitive environment <is associated with> Changes on the competitive environment o..
 Competitive environment <is associated with> Changes operated in the member companies..
 Competitive environment <is associated with> More competition increases the need for ..
 Context <is associated with> communication vr technology
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 Cultural elements <is associated with> Other examples of a IS development
 Cultural elements <is part of> Open minded and non secretive managerial..
 Culture of cooperation <is associated with> Managers were acquainted
 Culture of cooperation <is associated with> No access barriers
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 Culture of cooperation <is associated with> The profile of the companies
 Culture of cooperation <is part of> How to build up communication
 Dependency <is associated with> It has not been a problem in the practic..
 Dependency <is part of> Increase of dependancy
 Difficult projects <is associated with> Projects that fail to realise
 Diversity <is associated with> Companies must fit
 EMERGENCE <is associated with> Companies must fit
 EMERGENCE <is associated with> Culture of cooperation
 EMERGENCE <is associated with> How to build up communication
 EMERGENCE <is associated with> Leadership
 EMERGENCE <is associated with> Learning to collaborate
 EMERGENCE <is associated with> Self-driven project
 EMERGENCE <is cause of> Competitive environment
 EMERGENCE <is cause of> Water shortage
 Endogenous idea <is associated with> Most of the ideas and projects have been..
 Endogenous idea <is associated with> No intervention of a third party or auth..
 engagement <is associated with> Industrial symbiosis as bottom-up
 Frequent communication <is associated with> How to build up communication
 Frequent communication <is associated with> Most of the ideas and projects have been..
 How to build up communication <is associated with> Context
 How to build up communication <is associated with> Knowledge of the other companies

How to build up communication <is part of> communication and trust requires strong ..

How to build up communication <is part of> Communication was good

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Important factors that have favoured the.. <is associated with> No access barriers

Important factors that have favoured the.. <is associated with> No direct competitors

Important factors that have favoured the.. <is associated with> Short geographical distance

Important factors that have favoured the.. <is associated with> The size of the community

Important factors that have favoured the.. <is cause of> Short mental distance

Important factors that have favoured the.. <is part of> Companies must fit

Important factors that have favoured the.. <is part of> Coordination and timing

Important factors that have favoured the.. <is part of> Culture of cooperation

Important factors that have favoured the.. <is part of> Diversity

Important factors that have favoured the.. <is part of> Endogenous idea

Important factors that have favoured the.. <is part of> institutionalisation network

Important factors that have favoured the.. <is part of> Knowledge of the other companies

Important factors that have favoured the.. <is part of> Leadership

Important factors that have favoured the.. <is part of> Mutual benefit

Important factors that have favoured the.. <is part of> No legal barriers

Important factors that have favoured the.. <is part of> Personal relations

Important factors that have favoured the.. <is part of> Willingness to cooperate

Increase of dependancy <is associated with> Critiques to Kalundborg

Independent projects <is associated with> Collaboration on a project brought more p..

institutionalisation network <is associated with> Education system

institutionalisation network <is associated with> How to build up communication

institutionalisation network <is associated with> IS institute

Involve different levels of the hierarch.. <is associated with> How to build up communication

It has not been a problem in the practic.. <is a> Dependency is not a problem in Kalundbor..

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it takes time <is associated with> Realisation of the idea

Knowledge of the other companies <is associated with> Basic knowledge of each other's processe..

Leadership <is associated with> awareness of the symbiosis

Leadership <is associated with> Green champion

Learning to collaborate <is associated with> Collaboration on a project brought more

p..

Learning to collaborate <is associated with> communication vr technology

Learning to collaborate <is associated with> Having time

Learning to collaborate <is associated with> How to build up communication

Learning to collaborate <is associated with> Knowledge of the other companies

Managers were acquainted <is associated with> Basic knowledge of each other's processe..

Managers were acquainted <is associated with> How to build up communication

Managers were acquainted <is associated with> No access barriers

Managers were acquainted <is associated with> Open minded and non secretive managerial..

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Mature networks <is associated with> Difficulty to generate new ideas

Mature networks <is associated with> Generation change problem

Mature networks <is associated with> Maintain the interest

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No access barriers <is part of> No direct competitors

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No access barriers <is part of> Short mental distance

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Self-driven project <is associated with> Endogenous idea

Self-driven project <is associated with> Independent projects

Self-driven project <is associated with> Mutual benefit

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Short geographical distance <is associated with> The size of the community

Short mental distance <is cause of> Communication was good

Short mental distance <is part of> Frequent communication

small town <is associated with> Managers were acquainted

SME's involvement <is part of> SME has less resources

Spontaneous <is associated with> Independent projects

Spontaneous <is associated with> Self-driven project

The role of trust <is associated with> No access barriers

The sense of community between companies.. <is associated with> Managers were

acquainted

The sense of community between companies.. <is associated with> small town

TRUST <is associated with> Asociasionism culture/ collaboration cu..

TRUST <is associated with> Commitment to an idea

TRUST <is associated with> communication and trust requires strong ..

TRUST <is associated with> Cultural elements

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial..

TRUST <is associated with> Past history of cooperation

TRUST <is associated with> Risk and trust

TRUST <is associated with> small town

TRUST <is associated with> Will and choice

TRUST <is part of> The role of trust

Water shortage <is associated with> SHARED PROBLEM

Will and choice <is associated with> Commitment to an idea

Will and choice <is part of> Willingness to cooperate

Willingness to cooperate <is associated with> engagement

Willingness to cooperate <is part of> Short mental distance

2. List of Codes

Code-Filter: All

HU: KALUNDBORG6
File: [R:\PHD\KALUNDBORG6.hpr5]
Edited by: Super
Date/Time: 10/05/2010 16:45:00

80's driver regulatory requirements
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Accumulated savings
Actors
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Barriers
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Benefits of formal network
Best alternative
Bottom-up vr Top Down
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Willingness to cooperate
win-win
working across the fence
Would the symbiosis have realised in other circumstances/

3. Code Neighbours

HU: KALUNDBORG6
File: [R:\PHD\KALUNDBORG6.hpr5]
Edited by: Super
Date/Time: 10/05/2010 16:45:37

Code neighbors list
Code-Filter: All [247]

80's driver regulatory requirements

90's driver regulation and technical solutions

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Accumulated savings

Actors

"The companies involved in the IS network in Kalundborg have integrated sustainability at the core of the corporate strategy. They occupied top positions on the Dow Jones Sustainability index, although IS is not a common practice in all the locations of the company."

Adaptability

CHALLENGES <is associated with>

An incentive for companies to stay in the region

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<is associated with> Open minded and non secretive managerial style

TRUST <is associated with>

associations

Attraction of other companies into the network

Average payback period

awareness of the symbiosis

<is associated with> Green champion

Leadership <is associated with>

Barriers

CHALLENGES <is part of>

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Managers were acquainted <is associated with>

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Boundaries of the network

Business perspective

by-product networks

By-products

Calculation of economic benefits

Calculation of economic savings

Challenge people to think in the IS to find a solution

CHALLENGES

<is associated with> Adaptability

<is part of> Barriers

<is associated with> Dependency

<is associated with> Different payback periods

<is associated with> Difficult projects

<is associated with> Difficulty to attract companies based on IS exchanges

<is associated with> Increase of dependancy

<is associated with> it takes time

<is associated with> Mature networks

<is part of> Risk

<is associated with> SME's involvement

<is associated with> Survival of the network in the long term

<is associated with> Would the symbiosis have realised in other circumstances/

Change

Changes in priorities

Changes in regulation

Changes on the competitive environment of the companies

Competitive environment <is associated with>

Changes operated in the member companies

Competitive environment <is associated with>

Collaborate at the early stages of the idea development

Collaboration

Collaboration on a project brough more projects

Independent projects <is associated with>

Learning to collaborate <is associated with>

Collaboration takes time and resources

Commitment to an idea

TRUST <is associated with>

Will and choice <is associated with>

communication and trust requires strong social relationships among members

How to build up communication <is part of>

Personal relations <is associated with>

TRUST <is associated with>

communication vr technology

Context <is associated with>

Learning to collaborate <is associated with>

Communication was good

<is part of> Frequent communication

<is cause of> Managers were acquainted

<is associated with> Why communication was good

How to build up communication <is part of>

Short mental distance <is cause of>

Companies must fit

Diversity <is associated with>

EMERGENCE <is associated with>

Important factors that have favoured the symbiosis <is part of>

Self-driven project <is associated with>

Compensate for time

Competitive environment

<is associated with> Changes on the competitive environment of the companies

<is associated with> Changes operated in the member companies

<is associated with> More competition increases the need for smart solutions

EMERGENCE <is cause of>

Connection with Agenda21

Context

<is associated with> communication vr technology

How to build up communication <is associated with>

Continous or one off exchanges

cooperation in other areas

Coordination and timing

Important factors that have favoured the symbiosis <is part of>

Credibility

Critiques to Kalundborg

Increase of dependancy <is associated with>

CRS

Cultural elements

<is part of> Open minded and non secretive managerial style

<is associated with> Other case studies in Denmark of industrial symbiosis

<is associated with> Other examples of a IS development

TRUST <is associated with>

Culture of cooperation

<is part of> How to build up communication

<is associated with> Managers were acquainted

<is associated with> No access barriers

<is associated with> The culture of waste exchange

<is associated with> The profile of the companies

EMERGENCE <is associated with>

Important factors that have favoured the symbiosis <is part of>

Open minded and non secretive managerial style <is associated with>

Definiton of good behaviour, embedded rules

Dependency

<is part of> Increase of dependancy

<is associated with> It has not been a problem in the practice the increase of dependency

CHALLENGES <is associated with>

Dependency is not a problem in Kalundborg

It has not been a problem in the practice the increase of dependency
<is a>

Differencies between cluster theory and IS networks

Different payback periods

CHALLENGES <is associated with>

Difficult projects

<is associated with> Projects that fail to realise

CHALLENGES <is associated with>

Difficult to calculate the economic savings

Difficulties of SMEs to involve in IS projects

Difficulty to attract companies based on IS exchanges

CHALLENGES <is associated with>

Difficulty to generate new ideas

Mature networks <is associated with>

Direct competitors

Diversity

<is associated with> Companies must fit

Important factors that have favoured the symbiosis <is part of>

Drivers for the IS exchanges

economic and environmental benefits

Economic constrains

economic incentive

Education system

institutionalisation network <is associated with>

EMERGENCE

<is associated with> Companies must fit

<is cause of> Competitive environment

<is associated with> Culture of cooperation

<is associated with> How to build up communication

<is associated with> Leadership

<is associated with> Learning to collaborate

<is associated with> Self-driven project

<is cause of> Water shortage

Endogenous idea

<is associated with> Most of the ideas and projects have been generated inside the network

<is associated with> No intervention of a third party or authority

Important factors that have favoured the symbiosis <is part of>

Self-driven project <is associated with>

engagement

<is associated with> Industrial symbiosis as bottom-up

Willingness to cooperate <is associated with>

Evolution of the network

EXCHANGE CONDITIONS

External projects

Flexibility

formalisation of exchanges in contracts

fragility

Frequent communication

<is associated with> How to build up communication

<is associated with> Most of the ideas and projects have been generated inside the network

Communication was good <is part of>

Short mental distance <is part of>

Generation change problem

Mature networks <is associated with>

Generation of ideas

Give signals from top management

Green accounting

Green champion

awareness of the symbiosis <is associated with>

Leadership <is associated with>

Green taxes

Having time

Learning to collaborate <is associated with>

Heuistics of IS exchanges

Homogeneous by-products

How is the environmental problem framed and rules of the companies to integrate it

How to build up communication

<is part of> communication and trust requires strong social relationships among members

<is part of> Communication was good

<is associated with> Context

<is associated with> Knowledge of the other companies

Culture of cooperation <is part of>

EMERGENCE <is associated with>

Frequent communication <is associated with>

institutionalisation network <is associated with>

Involve different levels of the hierarchy <is associated with>

Learning to collaborate <is associated with>

Managers were acquainted <is associated with>

No access barriers <is associated with>

How to promote EIP

Important factors that have favoured the symbiosis <is associated with>

Important factors that have favoured the symbiosis

<is part of> Companies must fit

<is part of> Coordination and timing

<is part of> Culture of cooperation

<is part of> Diversity

<is part of> Endogenous idea

<is associated with> How to promote EIP

<is part of> institutionalisation network

<is part of> Knowledge of the other companies

<is part of> Leadership

<is part of> Mutual benefit

<is associated with> No access barriers

<is associated with> No direct competitors

- <is part of> No legal barriers
- <is part of> Personal relations
- <is associated with> Short geographical distance
- <is cause of> Short mental distance
- <is associated with> The size of the community
- <is part of> Willingness to cooperate

Improve satisfaction of employees

Improving eco-efficiency of the projects

Increase of dependancy

- <is associated with> Critiques to Kalundborg
- CHALLENGES <is associated with>
- Dependency <is part of>

Independent projects

- <is associated with> Collaboration on a project brough more projects
- Self-driven project <is associated with>
- Spontaneous <is associated with>

Industrial symbiosis as bottom-up
engagement <is associated with>

informal vr formal network

Innovation

institutionalisation network

- <is associated with> Education system
- <is associated with> How to build up communication
- <is associated with> IS institute
- Important factors that have favoured the symbiosis <is part of>

Internal projects

Investments

Involve different levels of the hierarchy
<is associated with> How to build up communication

IS and regional development

IS and the market companies operate in

IS as part of the environmental image of the company

IS in the waste management strategy

IS institute

- institutionalisation network <is associated with>

Is Kalundborg a rigid system?

IS policy framework

IS thinking is introduced in the company's routines

It depends on the people

It has not been a problem in the practice the increase of dependency

<is a> Dependency is not a problem in Kalundborg

<is associated with> Possibility to go back to more standard solutions

Dependency <is associated with>

it takes time

<is associated with> Realisation of the idea

CHALLENGES <is associated with>

Joint problem solving

Kalundborg as a practical and working example

Kalundborg as model

Knowledge of the other companies

<is associated with> Basic knowledge of each other's processes

How to build up communication <is associated with>

Important factors that have favoured the symbiosis <is part of>

Learning to collaborate <is associated with>

large industries in limited geographical distance

Short geographical distance <is associated with>

Leadership

<is associated with> awareness of the symbiosis

<is associated with> Green champion

EMERGENCE <is associated with>

Important factors that have favoured the symbiosis <is part of>

Learning to collaborate

<is associated with> Collaboration on a project brought more projects

<is associated with> communication vr technology

<is associated with> Having time

<is associated with> How to build up communication

<is associated with> Knowledge of the other companies

EMERGENCE <is associated with>

SHARED PROBLEM <is associated with>

Lessons from Kalundborg

License to operate

Local bridges

Low priority given to by-products and waste within the strategy of the company

Maintain the interest

Mature networks <is associated with>

Managers were acquainted

- <is associated with> Basic knowledge of each other's processes
- <is associated with> How to build up communication
- <is associated with> No access barriers
- <is associated with> Open minded and non secretive managerial style
- <is associated with> Personal relations
- <is associated with> Short mental distance
- Communication was good <is cause of>
- Culture of cooperation <is associated with>
- small town <is associated with>
- The sense of community between companies <is associated with>
- TRUST <is associated with>

Markets the company members are operating in

Mature networks

- <is associated with> Difficulty to generate new ideas
- <is associated with> Generation change problem
- <is associated with> Maintain the interest
- CHALLENGES <is associated with>

members of the network

Methodological issues

More competition increases the need for smart solutions
Competitive environment <is associated with>

More mental than technological innovation

Most of the ideas and projects have been generated inside the network
Endogenous idea <is associated with>
Frequent communication <is associated with>

Mutual benefit

- Important factors that have favoured the symbiosis <is part of>
- Self-driven project <is associated with>

Negotiation of contracts

Negotiation of regulation

Network and context

New potential projects in Kalundborg

No access barriers

- <is associated with> How to build up communication
- <is part of> No direct competitors
- <is part of> Short geographical distance
- <is part of> Short mental distance
- Culture of cooperation <is associated with>
- Important factors that have favoured the symbiosis <is associated with>

with>
Managers were acquainted <is associated with>
Personal relations <is part of>
The role of trust <is associated with>

No direct competitors
Important factors that have favoured the symbiosis <is associated with>
No access barriers <is part of>

No intervention of a third party or authority
Endogenous idea <is associated with>

No legal barriers
Important factors that have favoured the symbiosis <is part of>

Novo industry

Number of projects in the network

Open minded and non secretive managerial style
<is associated with> Culture of cooperation
Associasionism culture/ collaboration culture <is associated with>
Cultural elements <is part of>
Managers were acquainted <is associated with>
TRUST <is associated with>

operation of the network

Optimal solutions

Other case studies in Denmark of industrial symbiosis
Cultural elements <is associated with>
Other examples of a IS development <is part of>

Other examples of a IS development
<is part of> Other case studies in Denmark of industrial symbiosis
Cultural elements <is associated with>

Past history of cooperation
TRUST <is associated with>

Payback periods

People key element

Personal relations
<is associated with> communication and trust requires strong social relationships among members
<is part of> No access barriers
Important factors that have favoured the symbiosis <is part of>
Managers were acquainted <is associated with>

Policy

Possibility to develop the kalundborg model somewhere else

Possibility to go back to more standard solutions

It has not been a problem in the practice the increase of dependency
<is associated with>

PROBATION

Problems in calculating the economic benefits

Projects that fail to realise

Difficult projects <is associated with>

Projects were chosen ultimately because they helped to save costs

Realisation of the idea

it takes time <is associated with>

Refinery

Regional, national and international connexions

regulation as barrier and driver

Regulators

Relationship with the regulators

relevance of IS exchanges in relation to waste management

Resources

Restructuration and the evolution of IS

Risk

CHALLENGES <is part of>

Risk and trust

TRUST <is associated with>

Rotterdam harbour

Savings and environmental benefits

Savings in environmental management costs

Savings per year

Self-driven project

<is associated with> Companies must fit

<is associated with> Endogenous idea

<is associated with> Independent projects

<is associated with> Mutual benefit

EMERGENCE <is associated with>

Spontaneous <is associated with>

Semantics of IS

SHARED PROBLEM

<is associated with> Learning to collaborate

Water shortage <is associated with>

Short geographical distance

<is associated with> large industries in limited geographical distance

<is associated with> The size of the community

Important factors that have favoured the symbiosis <is associated with>

No access barriers <is part of>

Short mental distance

<is cause of> Communication was good

<is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of>

Managers were acquainted <is associated with>

No access barriers <is part of>

Willingness to cooperate <is part of>

shows the will to go beyond words

Size of the company

Size of the network

small town

<is associated with> Managers were acquainted

The sense of community between companies <is associated with>

TRUST <is associated with>

SME has less resources

SME's involvement <is part of>

SME vr big companies

SME's involvement

<is part of> SME has less resources

CHALLENGES <is associated with>

Social vr technological innovation

Soilrem

some environmental investments will never pay back

Specifications

Specifications in contracts

Spontaneous

<is associated with> Independent projects

<is associated with> Self-driven project
Stability of the core network
Survival of the network in the long term
CHALLENGES <is associated with>
Sustainability is embedded in the technical education
Sustainability leadership
symbiosis
Tacit rules and norms
Taxation on energy
Technical capability of SMEs
The "spirit" of IS
the collaboration with the aut..
The culture of waste exchange
Culture of cooperation <is associated with>
The decision-making process: Factors
The definition of IS
The electricity market
The engineering approach to IS
The environmental profile of the companies
The future of Kalundborg
The importance of communication
The institutional framework of IS
The life-cycle of a project
The meaning of profitability
The municipality
The problem of waste
The problem to create trust in large networks
The process
The profile of the companies

Culture of cooperation <is associated with>

The role of regulation

The role of the facilitator

The role of the managers in promoting IS thinking

The role of the municipality

The role of the waste handling company

The role of trust
 <is associated with> No access barriers
 TRUST <is part of>

The sense of community between companies
 <is associated with> Managers were acquainted
 <is associated with> small town

The size of the community
 Important factors that have favoured the symbiosis <is associated with>
 Short geographical distance <is associated with>

The story of the story

transaction costs

TRUST
 <is associated with> Associasionism culture/ collaboration culture
 <is associated with> Commitment to an idea
 <is associated with> communication and trust requires strong social relationships among members
 <is associated with> Cultural elements
 <is associated with> Managers were acquainted
 <is associated with> Open minded and non secretive managerial style
 <is associated with> Past history of cooperation
 <is associated with> Risk and trust
 <is associated with> small town
 <is part of> The role of trust
 <is associated with> Will and choice

Types of IS projects

Voluntary

Waste handling company

Waste in the overall stragety of the company

Waste streams

Water shortage
 <is associated with> SHARED PROBLEM

EMERGENCE <is cause of>

We learned a lot about each other

well structured civil society

Why communication was good
Communication was good <is associated with>

Why did it happen in Kalundborg

Widespread of the Kalundborg model within the different company plants

Widespread of the project

Will and choice
<is associated with> Commitment to an idea
<is part of> Willingness to cooperate
TRUST <is associated with>

Willingness to cooperate
<is associated with> engagement
<is part of> Short mental distance
Important factors that have favoured the symbiosis <is part of>
Will and choice <is part of>

win-win

working across the fence

Would the symbiosis have realised in other circumstances/
CHALLENGES <is associated with>

4. Codes hierarchy

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80's driver regulatory requirements <is> Root

90's driver regulation and technical solutions <is> Root

A project managed by the companies <is> Root

Accumulated savings <is> Root

Actors <is> Root

Adaptability <is> Root

CHALLENGES <is associated with> Adaptability

An incentive for companies to stay in the region <is> Root

Associasionism culture/ collaboration culture <is> Root

TRUST <is associated with> Associasionism culture/ collaboration culture

associations <is> Root

Attraction of other companies into the network <is> Root

Average payback period <is> Root

awareness of the symbiosis <is> Root

Leadership <is associated with> awareness of the symbiosis

EMERGENCE <is associated with> Leadership

Important factors that have favoured the symbiosis <is part of> Leadership

Barriers <is> Root

CHALLENGES <is part of> Barriers

Basic knowledge of each other's processes <is> Root

Knowledge of the other companies <is associated with> Basic knowledge of each other's processes

How to build up communication <is associated with> Knowledge of the other companies

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of

cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Short mental distance <is cause of> Communication was good

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation
 network
 Involve different levels of the hierarchy <is associated with> How to build up
 communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> Knowledge of the other
 companies
 Learning to collaborate <is associated with> Knowledge of the other companies
 Managers were acquainted <is associated with> Basic knowledge of each other's processes

Benefits of formal network <is> Root

Best alternative <is> Root

Bottom-up vr Top Down <is> Root

Boundaries of the network <is> Root

Business perspective <is> Root

by-product networks <is> Root

By-products <is> Root

Calculation of economic benefits <is> Root

Calculation of economic savings <is> Root

Challenge people to think in the IS to find a solution <is> Root

CHALLENGES <is> Root

Change <is> Root

Changes in priorities <is> Root

Changes in regulation <is> Root

Changes on the competitive environment of the companies <is> Root

 Competitive environment <is associated with> Changes on the competitive environment of the
 companies

 EMERGENCE <is cause of> Competitive environment

Changes operated in the member companies <is> Root

Competitive environment <is associated with> Changes operated in the member companies
EMERGENCE <is cause of> Competitive environment

Collaborate at the early stages of the idea development <is> Root

Collaboration <is> Root

Collaboration on a project brought more projects <is> Root
Independent projects <is associated with> Collaboration on a project brought more projects
Self-driven project <is associated with> Independent projects
EMERGENCE <is associated with> Self-driven project
Spontaneous <is associated with> Self-driven project
Spontaneous <is associated with> Independent projects
Learning to collaborate <is associated with> Collaboration on a project brought more projects
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage

Collaboration takes time and resources <is> Root

Commitment to an idea <is> Root
TRUST <is associated with> Commitment to an idea
Will and choice <is associated with> Commitment to an idea
TRUST <is associated with> Will and choice

communication and trust requires strong social relationships among members <is> Root
How to build up communication <is part of> communication and trust requires strong social relationships among members
Culture of cooperation <is part of> How to build up communication
EMERGENCE <is associated with> Culture of cooperation
Important factors that have favoured the symbiosis <is part of> Culture of cooperation
Open minded and non secretive managerial style <is associated with> Culture of cooperation
Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style
TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style
TRUST <is associated with> Cultural elements
Managers were acquainted <is associated with> Open minded and non secretive managerial style
Communication was good <is cause of> Managers were acquainted
How to build up communication <is part of> Communication was good
Short mental distance <is cause of> Communication was good
Important factors that have favoured the symbiosis <is cause of> Short mental distance
Managers were acquainted <is associated with> Short mental distance
No access barriers <is part of> Short mental distance
Culture of cooperation <is associated with> No access barriers
Important factors that have favoured the symbiosis <is associated

with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 EMERGENCE <is associated with> How to build up communication
 Frequent communication <is associated with> How to build up communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Personal relations <is associated with> communication and trust requires strong social relationships among members
 TRUST <is associated with> communication and trust requires strong social relationships among members
 communication vr technology <is> Root
 Context <is associated with> communication vr technology
 How to build up communication <is associated with> Context
 Culture of cooperation <is part of> How to build up communication
 EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Short mental distance <is cause of> Communication was good

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation
 network
 Involve different levels of the hierarchy <is associated with> How to build up
 communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Learning to collaborate <is associated with> communication vr technology

Communication was good <is> Root

How to build up communication <is part of> Communication was good
 Culture of cooperation <is part of> How to build up communication
 EMERGENCE <is associated with> Culture of cooperation
 Important factors that have favoured the symbiosis <is part of> Culture of cooperation
 Open minded and non secretive managerial style <is associated with> Culture of
 cooperation
 Associasionism culture/ collaboration culture <is associated with> Open minded
 and non secretive managerial style
 TRUST <is associated with> Associasionism culture/ collaboration culture
 Cultural elements <is part of> Open minded and non secretive managerial style
 TRUST <is associated with> Cultural elements
 Managers were acquainted <is associated with> Open minded and non secretive
 managerial style
 Communication was good <is cause of> Managers were acquainted
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small
 town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers
 were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 EMERGENCE <is associated with> How to build up communication
 Frequent communication <is associated with> How to build up communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 Important factors that have favoured the symbiosis <is cause of> Short mental
 distance
 Managers were acquainted <is associated with> Short mental distance
 No access barriers <is part of> Short mental distance
 Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Short mental distance <is cause of> Communication was good

Companies must fit <is> Root

Diversity <is associated with> Companies must fit
 Important factors that have favoured the symbiosis <is part of> Diversity
 EMERGENCE <is associated with> Companies must fit
 Important factors that have favoured the symbiosis <is part of> Companies must fit
 Self-driven project <is associated with> Companies must fit
 EMERGENCE <is associated with> Self-driven project
 Spontaneous <is associated with> Self-driven project

Compensate for time <is> Root

Competitive environment <is> Root
 EMERGENCE <is cause of> Competitive environment

Connection with Agenda21 <is> Root

Context <is> Root

How to build up communication <is associated with> Context
 Culture of cooperation <is part of> How to build up communication
 EMERGENCE <is associated with> Culture of cooperation
 Important factors that have favoured the symbiosis <is part of> Culture of cooperation
 Open minded and non secretive managerial style <is associated with> Culture of

cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Short mental distance <is cause of> Communication was good

Important factors that have favoured the symbiosis <is cause of>

Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of>

Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage
Managers were acquainted <is associated with> How to build up communication
No access barriers <is associated with> How to build up communication

Continous or one off exchanges <is> Root

cooperation in other areas <is> Root

Coordination and timing <is> Root

Important factors that have favoured the symbiosis <is part of> Coordination and timing

Credibility <is> Root

Critiques to Kalundborg <is> Root

Increase of dependancy <is associated with> Critiques to Kalundborg

CHALLENGES <is associated with> Increase of dependancy

Dependency <is part of> Increase of dependancy

CHALLENGES <is associated with> Dependency

CRS <is> Root

Cultural elements <is> Root

TRUST <is associated with> Cultural elements

Culture of cooperation <is> Root

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of>

Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance
 Culture of cooperation <is associated with> No access barriers
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Short mental distance <is cause of> Communication was good
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style

Definiton of good behaviour, embedded rules <is> Root

Dependency <is> Root

CHALLENGES <is associated with> Dependency

Dependency is not a problem in Kalundborg <is> Root

It has not been a problem in the practice the increase of dependency <is a> Dependency is not a problem in Kalundborg

Dependency <is associated with> It has not been a problem in the practice the increase of
 dependency
 CHALLENGES <is associated with> Dependency

Differences between cluster theory and IS networks <is> Root

Different payback periods <is> Root
 CHALLENGES <is associated with> Different payback periods

Difficult projects <is> Root
 CHALLENGES <is associated with> Difficult projects

Difficult to calculate the economic savings <is> Root

Difficulties of SMEs to involve in IS projects <is> Root

Difficulty to attract companies based on IS exchanges <is> Root
 CHALLENGES <is associated with> Difficulty to attract companies based on IS exchanges

Difficulty to generate new ideas <is> Root
 Mature networks <is associated with> Difficulty to generate new ideas
 CHALLENGES <is associated with> Mature networks

Direct competitors <is> Root

Diversity <is> Root
 Important factors that have favoured the symbiosis <is part of> Diversity

Drivers for the IS exchanges <is> Root

economic and environmental benefits <is> Root

Economic constrains <is> Root

economic incentive <is> Root

Education system <is> Root
 institutionalisation network <is associated with> Education system
 Important factors that have favoured the symbiosis <is part of> institutionalisation
 network

EMERGENCE <is> Root

Endogenous idea <is> Root
 Important factors that have favoured the symbiosis <is part of> Endogenous idea
 Self-driven project <is associated with> Endogenous idea
 EMERGENCE <is associated with> Self-driven project
 Spontaneous <is associated with> Self-driven project

engagement <is> Root
 Willingness to cooperate <is associated with> engagement

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
Will and choice <is part of> Willingness to cooperate
TRUST <is associated with> Will and choice

Evolution of the network <is> Root

EXCHANGE CONDITIONS <is> Root

External projects <is> Root

Flexibility <is> Root

formalisation of exchanges in contracts <is> Root

fragility <is> Root

Frequent communication <is> Root

Communication was good <is part of> Frequent communication

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with>

Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up

communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Culture of cooperation <is associated with> No access barriers
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust
 Short mental distance <is cause of> Communication was good
 Important factors that have favoured the symbiosis <is cause of> Short mental distance
 Managers were acquainted <is associated with> Short mental distance
 No access barriers <is part of> Short mental distance
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 Short mental distance <is part of> Frequent communication

 Generation change problem <is> Root
 Mature networks <is associated with> Generation change problem
 CHALLENGES <is associated with> Mature networks

 Generation of ideas <is> Root

 Give signals from top management <is> Root

 Green accounting <is> Root

 Green champion <is> Root
 awareness of the symbiosis <is associated with> Green champion
 Leadership <is associated with> awareness of the symbiosis
 EMERGENCE <is associated with> Leadership
 Important factors that have favoured the symbiosis <is part of> Leadership
 Leadership <is associated with> Green champion

 Green taxes <is> Root

 Having time <is> Root

Learning to collaborate <is associated with> Having time
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage

Heuistics of IS exchanges <is> Root

Homogeneous by-products <is> Root

How is the environmental problem framed and rules of the companies to integrate it <is> Root

How to build up communication <is> Root

Culture of cooperation <is part of> How to build up communication
EMERGENCE <is associated with> Culture of cooperation
Important factors that have favoured the symbiosis <is part of> Culture of cooperation
Open minded and non secretive managerial style <is associated with> Culture of cooperation
Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style
TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style
TRUST <is associated with> Cultural elements
Managers were acquainted <is associated with> Open minded and non secretive managerial style
Communication was good <is cause of> Managers were acquainted
How to build up communication <is part of> Communication was good
Short mental distance <is cause of> Communication was good
Important factors that have favoured the symbiosis <is cause of> Short mental distance
Managers were acquainted <is associated with> Short mental distance
No access barriers <is part of> Short mental distance
Culture of cooperation <is associated with> No access barriers
Important factors that have favoured the symbiosis <is associated with> No access barriers
Managers were acquainted <is associated with> No access barriers
Personal relations <is part of> No access barriers
Important factors that have favoured the symbiosis <is part of> Personal relations
Managers were acquainted <is associated with> Personal relations
The role of trust <is associated with> No access barriers
TRUST <is part of> The role of trust
Willingness to cooperate <is part of> Short mental distance
Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
Willingness to cooperate
Will and choice <is part of> Willingness to cooperate
TRUST <is associated with> Will and choice
Culture of cooperation <is associated with> Managers were acquainted
small town <is associated with> Managers were acquainted
The sense of community between companies <is associated with> small town

TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 EMERGENCE <is associated with> How to build up communication
 Frequent communication <is associated with> How to build up communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication

 How to promote EIP <is> Root
 Important factors that have favoured the symbiosis <is associated with> How to promote EIP

 Important factors that have favoured the symbiosis <is> Root

 Improve satisfaction of employees <is> Root

 Improving eco-efficiency of the projects <is> Root

 Increase of dependancy <is> Root
 CHALLENGES <is associated with> Increase of dependancy
 Dependency <is part of> Increase of dependancy
 CHALLENGES <is associated with> Dependency

 Independent projects <is> Root
 Self-driven project <is associated with> Independent projects
 EMERGENCE <is associated with> Self-driven project
 Spontaneous <is associated with> Self-driven project
 Spontaneous <is associated with> Independent projects

 Industrial symbiosis as bottom-up <is> Root
 engagement <is associated with> Industrial symbiosis as bottom-up
 Willingness to cooperate <is associated with> engagement
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice

 informal vr formal network <is> Root

Innovation <is> Root

institutionalisation network <is> Root

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Internal projects <is> Root

Investments <is> Root

Involve different levels of the hierarchy <is> Root

IS and regional development <is> Root

IS and the market companies operate in <is> Root

IS as part of the environmental image of the company <is> Root

IS in the waste management strategy <is> Root

IS institute <is> Root

institutionalisation network <is associated with> IS institute

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Is Kalundborg a rigid system? <is> Root

IS policy framework <is> Root

IS thinking is introduced in the company's routines <is> Root

It depends on the people <is> Root

It has not been a problem in the practice the increase of dependency <is> Root

Dependency <is associated with> It has not been a problem in the practice the increase of dependency

CHALLENGES <is associated with> Dependency

it takes time <is> Root

CHALLENGES <is associated with> it takes time

Joint problem solving <is> Root

Kalundborg as a practical and working example <is> Root

Kalundborg as model <is> Root

Knowledge of the other companies <is> Root

How to build up communication <is associated with> Knowledge of the other companies

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of

cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Short mental distance <is cause of> Communication was good

Important factors that have favoured the symbiosis <is cause of>

Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of>

Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage
Managers were acquainted <is associated with> How to build up communication
No access barriers <is associated with> How to build up communication
Important factors that have favoured the symbiosis <is part of> Knowledge of the other companies
Learning to collaborate <is associated with> Knowledge of the other companies

large industries in limited geographical distance <is> Root
Short geographical distance <is associated with> large industries in limited geographical distance
Important factors that have favoured the symbiosis <is associated with> Short geographical distance
No access barriers <is part of> Short geographical distance
Culture of cooperation <is associated with> No access barriers
EMERGENCE <is associated with> Culture of cooperation
Important factors that have favoured the symbiosis <is part of> Culture of cooperation
Open minded and non secretive managerial style <is associated with> Culture of cooperation
Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style
TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style
TRUST <is associated with> Cultural elements
Managers were acquainted <is associated with> Open minded and non secretive managerial style
Communication was good <is cause of> Managers were acquainted
How to build up communication <is part of> Communication was good
Culture of cooperation <is part of> How to build up communication
EMERGENCE <is associated with> How to build up communication
Frequent communication <is associated with> How to build up communication
Communication was good <is part of> Frequent communication
Short mental distance <is part of> Frequent communication
Important factors that have favoured the symbiosis <is cause of> Short mental distance
Managers were acquainted <is associated with> Short mental distance
No access barriers <is part of> Short mental distance
Willingness to cooperate <is part of> Short mental

distance

- Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
- Will and choice <is part of> Willingness to cooperate
- TRUST <is associated with> Will and choice
- institutionalisation network <is associated with> How to build up communication
- Important factors that have favoured the symbiosis <is part of> institutionalisation network
- Involve different levels of the hierarchy <is associated with> How to build up communication
- Learning to collaborate <is associated with> How to build up communication
- EMERGENCE <is associated with> Learning to collaborate
- SHARED PROBLEM <is associated with> Learning to collaborate
- Water shortage <is associated with> SHARED PROBLEM
- EMERGENCE <is cause of> Water shortage
- Managers were acquainted <is associated with> How to build up communication
- No access barriers <is associated with> How to build up communication
- Short mental distance <is cause of> Communication was good
- Culture of cooperation <is associated with> Managers were acquainted
- small town <is associated with> Managers were acquainted
- The sense of community between companies <is associated with> small town
- TRUST <is associated with> small town
- The sense of community between companies <is associated with> Managers were acquainted
- TRUST <is associated with> Managers were acquainted
- TRUST <is associated with> Open minded and non secretive managerial style
- Important factors that have favoured the symbiosis <is associated with> No access barriers
- Managers were acquainted <is associated with> No access barriers
- Personal relations <is part of> No access barriers
- Important factors that have favoured the symbiosis <is part of> Personal relations
- Managers were acquainted <is associated with> Personal relations
- The role of trust <is associated with> No access barriers
- TRUST <is part of> The role of trust

Leadership <is> Root

- EMERGENCE <is associated with> Leadership

- Important factors that have favoured the symbiosis <is part of> Leadership

Learning to collaborate <is> Root

- EMERGENCE <is associated with> Learning to collaborate

- SHARED PROBLEM <is associated with> Learning to collaborate

- Water shortage <is associated with> SHARED PROBLEM

EMERGENCE <is cause of> Water shortage

Lessons from Kalundborg <is> Root

License to operate <is> Root

Local bridges <is> Root

Low priority given to by-products and waste within the strategy of the company <is> Root

Maintain the interest <is> Root

Mature networks <is associated with> Maintain the interest

CHALLENGES <is associated with> Mature networks

Managers were acquainted <is> Root

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

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TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with>

No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of>

Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of>
 Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation
 network
 Involve different levels of the hierarchy <is associated with> How to build up
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 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
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 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
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 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted

Markets the company members are operating in <is> Root

Mature networks <is> Root

CHALLENGES <is associated with> Mature networks

members of the network <is> Root

Methodological issues <is> Root

More competition increases the need for smart solutions <is> Root

Competitive environment <is associated with> More competition increases the need for smart
 solutions

EMERGENCE <is cause of> Competitive environment

More mental than technological innovation <is> Root

Most of the ideas and projects have been generated inside the network <is> Root

Endogenous idea <is associated with> Most of the ideas and projects have been generated
 inside the network

Important factors that have favoured the symbiosis <is part of> Endogenous idea

Self-driven project <is associated with> Endogenous idea

EMERGENCE <is associated with> Self-driven project

Spontaneous <is associated with> Self-driven project

Frequent communication <is associated with> Most of the ideas and projects have been

generated inside the network

Communication was good <is part of> Frequent communication

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted
Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with>

Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication

EMERGENCE <is associated with> Learning to collaborate

SHARED PROBLEM <is associated with> Learning to collaborate

Water shortage <is associated with> SHARED PROBLEM

EMERGENCE <is cause of> Water shortage

Managers were acquainted <is associated with> How to build up communication

No access barriers <is associated with> How to build up communication

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal

relations
Managers were acquainted <is associated with> Personal relations
The role of trust <is associated with> No access barriers
TRUST <is part of> The role of trust
Short mental distance <is cause of> Communication was good
Important factors that have favoured the symbiosis <is cause of> Short mental distance
Managers were acquainted <is associated with> Short mental distance
No access barriers <is part of> Short mental distance
Willingness to cooperate <is part of> Short mental distance
Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
Will and choice <is part of> Willingness to cooperate
TRUST <is associated with> Will and choice
Short mental distance <is part of> Frequent communication

Mutual benefit <is> Root

Important factors that have favoured the symbiosis <is part of> Mutual benefit
Self-driven project <is associated with> Mutual benefit
EMERGENCE <is associated with> Self-driven project
Spontaneous <is associated with> Self-driven project

Negotiation of contracts <is> Root

Negotiation of regulation <is> Root

Network and context <is> Root

New potential projects in Kalundborg <is> Root

No access barriers <is> Root

Culture of cooperation <is associated with> No access barriers
EMERGENCE <is associated with> Culture of cooperation
Important factors that have favoured the symbiosis <is part of> Culture of cooperation
Open minded and non secretive managerial style <is associated with> Culture of cooperation
Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style
TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style
TRUST <is associated with> Cultural elements
Managers were acquainted <is associated with> Open minded and non secretive managerial style
Communication was good <is cause of> Managers were acquainted
How to build up communication <is part of> Communication was good
Culture of cooperation <is part of> How to build up communication
EMERGENCE <is associated with> How to build up communication
Frequent communication <is associated with> How to build up communication
Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication
 Important factors that have favoured the symbiosis <is cause of> Short mental distance
 Managers were acquainted <is associated with> Short mental distance
 No access barriers <is part of> Short mental distance
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Short mental distance <is cause of> Communication was good
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust

No direct competitors <is> Root
 Important factors that have favoured the symbiosis <is associated with> No direct competitors
 No access barriers <is part of> No direct competitors
 Culture of cooperation <is associated with> No access barriers
 EMERGENCE <is associated with> Culture of cooperation
 Important factors that have favoured the symbiosis <is part of> Culture of cooperation
 Open minded and non secretive managerial style <is associated with> Culture of

cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture
Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication

EMERGENCE <is associated with> Learning to collaborate

SHARED PROBLEM <is associated with> Learning to collaborate

Water shortage <is associated with> SHARED PROBLEM

EMERGENCE <is cause of> Water shortage

Managers were acquainted <is associated with> How to build up communication

No access barriers <is associated with> How to build up communication

Short mental distance <is cause of> Communication was good

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers

were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust

No intervention of a third party or authority <is> Root
 Endogenous idea <is associated with> No intervention of a third party or authority
 Important factors that have favoured the symbiosis <is part of> Endogenous idea
 Self-driven project <is associated with> Endogenous idea
 EMERGENCE <is associated with> Self-driven project
 Spontaneous <is associated with> Self-driven project

No legal barriers <is> Root
 Important factors that have favoured the symbiosis <is part of> No legal barriers

Novo industry <is> Root

Number of projects in the network <is> Root

Open minded and non secretive managerial style <is> Root
 Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style
 TRUST <is associated with> Associasionism culture/ collaboration culture
 Cultural elements <is part of> Open minded and non secretive managerial style
 TRUST <is associated with> Cultural elements
 Managers were acquainted <is associated with> Open minded and non secretive managerial style
 Communication was good <is cause of> Managers were acquainted
 How to build up communication <is part of> Communication was good
 Culture of cooperation <is part of> How to build up communication
 EMERGENCE <is associated with> Culture of cooperation
 Important factors that have favoured the symbiosis <is part of> Culture of cooperation
 Open minded and non secretive managerial style <is associated with> Culture of cooperation
 EMERGENCE <is associated with> How to build up communication
 Frequent communication <is associated with> How to build up communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 Important factors that have favoured the symbiosis <is cause of> Short mental distance
 Managers were acquainted <is associated with> Short mental distance
 No access barriers <is part of> Short mental distance
 Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up communication
 Important factors that have favoured the symbiosis <is part of> institutionalisation network
 Involve different levels of the hierarchy <is associated with> How to build up communication
 Learning to collaborate <is associated with> How to build up communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Short mental distance <is cause of> Communication was good
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style

operation of the network <is> Root

Optimal solutions <is> Root

Other case studies in Denmark of industrial symbiosis <is> Root

 Cultural elements <is associated with> Other case studies in Denmark of industrial symbiosis

 TRUST <is associated with> Cultural elements

 Other examples of a IS development <is part of> Other case studies in Denmark of industrial symbiosis

 Cultural elements <is associated with> Other examples of a IS development

Other examples of a IS development <is> Root

 Cultural elements <is associated with> Other examples of a IS development

 TRUST <is associated with> Cultural elements

Past history of cooperation <is> Root

TRUST <is associated with> Past history of cooperation

Payback periods <is> Root

People key element <is> Root

Personal relations <is> Root

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

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TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of>

Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

institutionalisation network <is associated with> How to build up communication
Important factors that have favoured the symbiosis <is part of>
institutionalisation network
Involve different levels of the hierarchy <is associated with> How to build up
communication
Learning to collaborate <is associated with> How to build up communication
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage
Managers were acquainted <is associated with> How to build up communication
No access barriers <is associated with> How to build up communication
Short mental distance <is cause of> Communication was good
Culture of cooperation <is associated with> Managers were acquainted
small town <is associated with> Managers were acquainted
The sense of community between companies <is associated with> small town
TRUST <is associated with> small town
The sense of community between companies <is associated with> Managers were
acquainted
TRUST <is associated with> Managers were acquainted

Policy <is> Root

Possibility to develop the kalundborg model somewhere else <is> Root

Possibility to go back to more standard solutions <is> Root

It has not been a problem in the practice the increase of dependency <is associated with>

Possibility to go back to more standard solutions

Dependency <is associated with> It has not been a problem in the practice the increase of
dependency

CHALLENGES <is associated with> Dependency

PROBATION <is> Root

Problems in calculating the economic benefits <is> Root

Projects that fail to realise <is> Root

Difficult projects <is associated with> Projects that fail to realise

CHALLENGES <is associated with> Difficult projects

Projects were chosen ultimately because they helped to save costs <is> Root

Realisation of the idea <is> Root

it takes time <is associated with> Realisation of the idea

CHALLENGES <is associated with> it takes time

Refinery <is> Root

Regional, national and international connexions <is> Root

regulation as barrier and driver <is> Root

Regulators <is> Root

Relationship with the regulators <is> Root

relevance of IS exchanges in relation to waste management <is> Root

Resources <is> Root

Restructuration and the evolution of IS <is> Root

Risk <is> Root

CHALLENGES <is part of> Risk

Risk and trust <is> Root

TRUST <is associated with> Risk and trust

Rotterdam harbour <is> Root

Savings and environmental benefits <is> Root

Savings in environmental management costs <is> Root

Savings per year <is> Root

Self-driven project <is> Root

EMERGENCE <is associated with> Self-driven project

Spontaneous <is associated with> Self-driven project

Semantics of IS <is> Root

SHARED PROBLEM <is> Root

Water shortage <is associated with> SHARED PROBLEM

EMERGENCE <is cause of> Water shortage

Short geographical distance <is> Root

Important factors that have favoured the symbiosis <is associated with> Short geographical distance

No access barriers <is part of> Short geographical distance

Culture of cooperation <is associated with> No access barriers

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted
 How to build up communication <is part of> Communication was good
 Culture of cooperation <is part of> How to build up communication
 EMERGENCE <is associated with> How to build up communication
 Frequent communication <is associated with> How to build up
 communication
 Communication was good <is part of> Frequent communication
 Short mental distance <is part of> Frequent communication
 Important factors that have favoured the symbiosis <is cause
 of> Short mental distance
 Managers were acquainted <is associated with> Short mental
 distance
 No access barriers <is part of> Short mental distance
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is
 part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice
 institutionalisation network <is associated with> How to build up
 communication
 Important factors that have favoured the symbiosis <is part of>
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 Involve different levels of the hierarchy <is associated with> How to
 build up communication
 Learning to collaborate <is associated with> How to build up
 communication
 EMERGENCE <is associated with> Learning to collaborate
 SHARED PROBLEM <is associated with> Learning to
 collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
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 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers
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 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers
TRUST <is part of> The role of trust

Short mental distance <is> Root

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

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TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

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Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication

EMERGENCE <is associated with> Learning to collaborate

SHARED PROBLEM <is associated with> Learning to collaborate

Water shortage <is associated with> SHARED PROBLEM

EMERGENCE <is cause of> Water shortage

Managers were acquainted <is associated with> How to build up communication

No access barriers <is associated with> How to build up communication

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Managers were acquainted <is associated with> Personal relations

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TRUST <is part of> The role of trust
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 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 No access barriers <is part of> Short mental distance
 Willingness to cooperate <is part of> Short mental distance
 Important factors that have favoured the symbiosis <is part of> Willingness to cooperate
 Will and choice <is part of> Willingness to cooperate
 TRUST <is associated with> Will and choice

shows the will to go beyond words <is> Root

Size of the company <is> Root

Size of the network <is> Root

small town <is> Root
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town

SME has less resources <is> Root
 SME's involvement <is part of> SME has less resources
 CHALLENGES <is associated with> SME's involvement

SME vr big companies <is> Root

SME's involvement <is> Root
 CHALLENGES <is associated with> SME's involvement

Social vr tecnological innovation <is> Root

Soilrem <is> Root

some environmental investments will never pay back <is> Root

Specifications <is> Root

Specifications in contracts <is> Root

Spontaneous <is> Root

Stability of the core network <is> Root

Survival of the network in the long term <is> Root
 CHALLENGES <is associated with> Survival of the network in the long term

Sustainability is embedded in the technical education <is> Root

Sustainability leadership <is> Root

symbiosis <is> Root

Tacit rules and norms <is> Root

Taxation on energy <is> Root

Technical capability of SMEs <is> Root

The "spirit" of IS <is> Root

the collaboration with the aut.. <is> Root

The culture of waste exchange <is> Root

Culture of cooperation <is associated with> The culture of waste exchange

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

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EMERGENCE <is associated with> How to build up communication

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Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is

part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
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 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style

The decision-making process: Factors <is> Root

The definition of IS <is> Root

The electricity market <is> Root

The engineering approach to IS <is> Root

The environmental profile of the companies <is> Root

The future of Kalundborg <is> Root

The importance of communication <is> Root

The institutional framework of IS <is> Root

The life-cycle of a project <is> Root

The meaning of profitability <is> Root

The municipality <is> Root

The problem of waste <is> Root

The problem to create trust in large networks <is> Root

The process <is> Root

The profile of the companies <is> Root

Culture of cooperation <is associated with> The profile of the companies

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

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 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style

The role of regulation <is> Root

The role of the facilitator <is> Root

The role of the managers in promoting IS thinking <is> Root

The role of the municipality <is> Root

The role of the waste handling company <is> Root

The role of trust <is> Root

TRUST <is part of> The role of trust

The sense of community between companies <is> Root

The size of the community <is> Root

Important factors that have favoured the symbiosis <is associated with> The size of the community

Short geographical distance <is associated with> The size of the community

Important factors that have favoured the symbiosis <is associated with> Short geographical distance

No access barriers <is part of> Short geographical distance

Culture of cooperation <is associated with> No access barriers

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

institutionalisation network <is associated with> How to build up communication

Important factors that have favoured the symbiosis <is part of> institutionalisation network

Involve different levels of the hierarchy <is associated with> How to build up communication

Learning to collaborate <is associated with> How to build up communication

EMERGENCE <is associated with> Learning to collaborate

SHARED PROBLEM <is associated with> Learning to collaborate
 Water shortage <is associated with> SHARED PROBLEM
 EMERGENCE <is cause of> Water shortage
 Managers were acquainted <is associated with> How to build up communication
 No access barriers <is associated with> How to build up communication
 Short mental distance <is cause of> Communication was good
 Culture of cooperation <is associated with> Managers were acquainted
 small town <is associated with> Managers were acquainted
 The sense of community between companies <is associated with> small town
 TRUST <is associated with> small town
 The sense of community between companies <is associated with> Managers were acquainted
 TRUST <is associated with> Managers were acquainted
 TRUST <is associated with> Open minded and non secretive managerial style
 Important factors that have favoured the symbiosis <is associated with> No access barriers
 Managers were acquainted <is associated with> No access barriers
 Personal relations <is part of> No access barriers
 Important factors that have favoured the symbiosis <is part of> Personal relations
 Managers were acquainted <is associated with> Personal relations
 The role of trust <is associated with> No access barriers
 TRUST <is part of> The role of trust

The story of the story <is> Root

transaction costs <is> Root

TRUST <is> Root

Types of IS projects <is> Root

Voluntary <is> Root

Waste handling company <is> Root

Waste in the overall strategy of the company <is> Root

Waste streams <is> Root

Water shortage <is> Root

EMERGENCE <is cause of> Water shortage

We learned a lot about each other <is> Root

well structured civil society <is> Root

Why communication was good <is> Root

Communication was good <is associated with> Why communication was good

How to build up communication <is part of> Communication was good

Culture of cooperation <is part of> How to build up communication

EMERGENCE <is associated with> Culture of cooperation

Important factors that have favoured the symbiosis <is part of> Culture of cooperation

Open minded and non secretive managerial style <is associated with> Culture of cooperation

Associasionism culture/ collaboration culture <is associated with> Open minded and non secretive managerial style

TRUST <is associated with> Associasionism culture/ collaboration culture

Cultural elements <is part of> Open minded and non secretive managerial style

TRUST <is associated with> Cultural elements

Managers were acquainted <is associated with> Open minded and non secretive managerial style

Communication was good <is cause of> Managers were acquainted

Culture of cooperation <is associated with> Managers were acquainted

small town <is associated with> Managers were acquainted

The sense of community between companies <is associated with> small town

TRUST <is associated with> small town

The sense of community between companies <is associated with> Managers were acquainted

TRUST <is associated with> Managers were acquainted

TRUST <is associated with> Open minded and non secretive managerial style

EMERGENCE <is associated with> How to build up communication

Frequent communication <is associated with> How to build up communication

Communication was good <is part of> Frequent communication

Short mental distance <is part of> Frequent communication

Important factors that have favoured the symbiosis <is cause of> Short mental distance

Managers were acquainted <is associated with> Short mental distance

No access barriers <is part of> Short mental distance

Culture of cooperation <is associated with> No access barriers

Important factors that have favoured the symbiosis <is associated with> No access barriers

Managers were acquainted <is associated with> No access barriers

Personal relations <is part of> No access barriers

Important factors that have favoured the symbiosis <is part of> Personal relations

Managers were acquainted <is associated with> Personal relations

The role of trust <is associated with> No access barriers

TRUST <is part of> The role of trust

Willingness to cooperate <is part of> Short mental distance

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice
institutionalisation network <is associated with> How to build up communication
Important factors that have favoured the symbiosis <is part of> institutionalisation
network
Involve different levels of the hierarchy <is associated with> How to build up
communication
Learning to collaborate <is associated with> How to build up communication
EMERGENCE <is associated with> Learning to collaborate
SHARED PROBLEM <is associated with> Learning to collaborate
Water shortage <is associated with> SHARED PROBLEM
EMERGENCE <is cause of> Water shortage
Managers were acquainted <is associated with> How to build up communication
No access barriers <is associated with> How to build up communication
Short mental distance <is cause of> Communication was good

Why did it happen in Kalundborg <is> Root

Widespread of the Kalundborg model within the different company plants <is> Root

Widespread of the project <is> Root

Will and choice <is> Root

TRUST <is associated with> Will and choice

Willingness to cooperate <is> Root

Important factors that have favoured the symbiosis <is part of> Willingness to cooperate

Will and choice <is part of> Willingness to cooperate

TRUST <is associated with> Will and choice

win-win <is> Root

working across the fence <is> Root

Would the symbiosis have realised in other circumstances/ <is> Root

CHALLENGES <is associated with> Would the symbiosis have realised in other
circumstances/

5. Primary Documents-Codes

CODES-PRIMARY-DOCUMENTS-TABLE (CELL=Q-FREQ)
 Report created by Super - 10/05/2010 16:46:57
 "HU: [R:\PHD\KALUNDBORG6.hpr5]"

Code-Filter: All [247]
 PD-Filter: All [5]
 Quotation-Filter: All [263]

CODES	PRIMARY DOCS					Totals
	1	2	3	5	6	
80's driver regulato	0	0	1	0	0	1
90's driver regulati	0	0	1	0	0	1
A project managed by	0	0	1	0	0	1
Accumulated savings	0	1	0	0	0	1
Actors	0	1	0	0	1	2
Adaptability	0	2	2	0	0	4
An incentive for com	0	0	0	0	1	1
Associasionism cultu	0	0	0	0	1	1
associations	0	0	0	0	1	1
Attraction of other	0	0	0	0	1	1
Average payback peri	0	1	0	0	0	1
awareness of the sym	0	1	0	0	0	1
Barriers	0	0	6	0	2	8
Basic knowledge of e	0	0	1	0	0	1
Benefits of formal n	0	0	1	0	0	1
Best alternative	0	0	5	0	0	5
Bottom-up vr Top Dow	0	1	0	0	0	1
Boundaries of the ne	0	0	0	0	1	1
Business perspective	0	0	1	0	0	1
by-product networks	0	0	0	0	1	1
By-products	0	0	0	0	1	1
Calculation of econo	0	2	0	0	1	3
Calculation of econo	0	1	0	0	1	2
Challenge people to	0	0	1	0	0	1
CHALLENGES	0	0	0	0	0	0
Change	0	1	3	0	1	5
Changes in prioritie	0	0	0	0	1	1
Changes in regulatio	0	0	0	0	1	1
Changes on the compe	0	0	1	0	0	1
Changes operated in	0	5	2	0	0	7
Collaborate at the e	0	0	1	0	0	1
Collaboration	0	2	2	0	0	4
Collaboration on a p	0	1	1	0	0	2
Collaboration takes	0	0	3	0	0	3
Commitment to an ide	0	0	0	0	3	3
communication and tr	0	0	1	0	0	1
communication vr tec	0	2	0	0	0	2
Communication was go	0	2	1	0	0	3

Companies must fit	0	1	0	0	0	1
Compensate for time	0	2	0	0	0	2
Competitive environm	0	0	1	0	0	1
Connection with Agen	0	0	0	0	1	1
Context	0	1	3	0	0	4
Continous or one off	0	1	0	0	0	1
cooperation in other	0	0	0	0	1	1
Coordination and tim	0	0	1	0	0	1
Credibility	0	0	0	0	1	1
Critiques to Kalundb	0	1	0	0	1	2
CRS	0	0	0	0	1	1
Cultural elements	0	0	2	0	0	2
Culture of cooperati	0	0	2	0	0	2
Definiton of good be	0	0	0	0	1	1
Dependency	0	0	0	0	2	2
Dependency is not a	0	0	0	0	1	1
Differencies between	0	0	0	0	1	1
Different payback pe	0	1	0	0	0	1
Difficult projects	0	0	0	0	1	1
Difficult to calcula	0	0	1	0	1	2
Difficulties of SMEs	0	0	1	0	0	1
Difficulty to attrac	0	0	0	0	2	2
Difficulty to genera	0	0	2	0	0	2
Direct competitors	0	0	1	0	0	1
Diversity	0	1	0	0	0	1
Drivers for the IS e	0	0	8	0	6	14
economic and environ	0	4	1	0	0	5
Economic constrains	0	0	1	0	0	1
economic incentive	0	3	5	0	0	8
Education system	0	0	0	0	1	1
EMERGENCE	0	0	0	0	2	2
Endogenous idea	0	1	0	0	0	1
engagement	0	1	0	0	1	2
Evolution of the net	0	3	2	0	3	8
EXCHANGE CONDITIONS	0	0	0	0	0	0
External projects	0	1	2	0	0	3
Flexibility	0	0	2	0	0	2
formalisation of exc	0	0	1	0	0	1
fragility	0	0	0	0	2	2
Frequent communicati	0	1	2	0	0	3
Generation change pr	0	2	0	0	1	3
Generation of ideas	0	0	1	0	0	1
Give signals from to	0	1	0	0	0	1
Green accounting	0	0	2	0	2	4
Green champion	0	2	4	0	0	6
Green taxes	0	2	0	0	0	2
Having time	0	1	0	0	0	1
Heuistics of IS exch	0	0	0	0	2	2
Homogeneous by-produ	0	0	0	0	1	1
How is the environme	0	0	0	0	2	2
How to build up comm	0	0	2	0	0	2
How to promote EIP	0	1	0	0	0	1
Important factors th	0	1	3	0	0	4
Improve satisfaction	0	0	1	0	0	1
Improving eco-effien	0	0	0	0	1	1

Increase of dependan	0	1	0	0	0	1
Independent projects	0	2	1	0	0	3
Industrial symbiosis	0	1	0	0	0	1
informal vr formal n	0	0	3	0	1	4
Innovation	0	0	1	0	2	3
institutionalisation	0	0	1	0	1	2
Internal projects	0	1	0	0	0	1
Investments	0	0	2	0	1	3
Involve different le	0	2	0	0	0	2
IS and regional deve	0	0	0	0	2	2
IS and the market co	0	0	0	0	1	1
IS as part of the en	0	0	1	0	3	4
IS in the waste mana	0	0	0	0	1	1
IS institute	0	1	1	0	2	4
Is Kalundborg a rigi	0	0	1	0	0	1
IS policy framework	0	0	0	0	3	3
IS thinking is intro	0	0	2	0	0	2
It depends on the pe	0	0	2	0	0	2
It has not been a pr	0	1	0	0	0	1
it takes time	0	0	0	0	1	1
Joint problem solvin	0	0	0	0	2	2
Kalundborg as a prac	0	0	1	0	0	1
Kalundborg as model	0	3	0	0	0	3
Knowledge of the oth	0	1	0	0	1	2
large industries in	0	1	0	0	0	1
Leadership	0	2	2	0	0	4
Learning to collabor	0	0	2	0	0	2
Lessons from Kalundb	0	0	1	0	0	1
License to operate	0	0	2	0	3	5
Local bridges	0	0	1	0	0	1
Low priority given t	0	0	0	0	3	3
Maintain the interes	0	0	0	0	1	1
Managers were acquai	0	1	1	0	0	2
Markets the company	0	0	0	0	2	2
Mature networks	0	1	2	0	1	4
members of the netwo	0	7	0	0	0	7
Methodological issue	0	4	0	0	0	4
More competition inc	0	0	1	0	0	1
More mental than tec	0	0	1	0	0	1
Most of the ideas an	0	0	1	0	0	1
Mutual benefit	0	1	0	0	0	1
Negotiation of contr	0	0	5	0	0	5
Negotiation of regul	0	0	1	0	0	1
Network and context	0	1	0	0	0	1
New potential projec	0	0	1	0	1	2
No access barriers	0	1	0	0	0	1
No direct competitor	0	2	1	0	0	3
No intervention of a	0	0	1	0	0	1
No legal barriers	0	1	0	0	0	1
Novo industry	0	1	0	0	0	1
Number of projects i	0	3	0	0	0	3
Open minded and non	0	1	0	0	0	1
operation of the net	0	0	1	0	0	1
Optimal solutions	0	2	4	0	0	6
Other case studies i	0	0	0	0	1	1

Other examples of a	0	1	0	0	0	1
Past history of coop	0	0	1	0	0	1
Payback periods	0	2	1	0	1	4
People key element	0	0	2	0	1	3
Personal relations	0	0	0	0	2	2
Policy	0	0	0	0	2	2
Possibility to devel	0	2	2	0	0	4
Possibility to go ba	0	0	1	0	1	2
PROBATION	0	0	0	0	0	0
Problems in calculat	0	1	0	0	0	1
Projects that fail t	0	1	0	0	0	1
Projects were chosen	0	0	1	0	0	1
Realisation of the i	0	0	1	0	0	1
Refinery	0	1	1	0	0	2
Regional, national a	0	0	0	0	1	1
regulation as barrie	0	0	0	0	3	3
Regulators	0	0	2	0	0	2
Relationship with th	0	0	4	0	2	6
relevance of IS exch	0	0	1	0	0	1
Resources	0	0	1	0	0	1
Restructuration and	0	0	1	0	0	1
Risk	0	0	2	0	0	2
Risk and trust	0	0	0	0	2	2
Rotterdam harbour	0	1	0	0	0	1
Savings and environm	0	1	0	0	0	1
Savings in environme	0	0	1	0	0	1
Savings per year	0	1	0	0	0	1
Self-driven project	0	2	1	0	1	4
Semantics of IS	0	3	0	0	0	3
SHARED PROBLEM	0	0	0	0	0	0
Short geographical d	0	1	2	0	0	3
Short mental distanc	0	1	1	0	0	2
shows the will to go	0	0	1	0	1	2
Size of the company	0	0	1	0	0	1
Size of the network	0	0	2	0	0	2
small town	0	0	2	0	0	2
SME has less resourc	0	0	1	0	0	1
SME vr big companies	0	0	1	0	0	1
SME's involvement	0	1	1	0	0	2
Social vr technologic	0	0	1	0	0	1
Soilrem	0	1	0	0	0	1
some environmental i	0	0	2	0	0	2
Specifications	0	0	1	0	2	3
Specifications in co	0	0	1	0	0	1
Spontaneous	0	2	0	0	1	3
Stability of the cor	0	0	0	0	1	1
Survival of the netw	0	0	0	0	1	1
Sustainability is em	0	0	0	0	1	1
Sustainability leade	0	0	0	0	1	1
symbiosis	0	1	0	0	0	1
Tacit rules and norm	0	0	1	0	1	2
Taxation on energy	0	0	4	0	0	4
Technical capability	0	0	1	0	0	1
The "spirit" of IS	0	0	0	0	1	1
the collaboration wi	0	0	1	0	0	1

The culture of waste	0	0	0	0	2	2
The decision-making	0	0	3	0	0	3
The definition of IS	0	7	0	0	1	8
The electricity mark	0	1	0	0	0	1
The engineering appr	0	0	0	0	1	1
The environmental pr	0	0	2	0	1	3
The future of Kalund	0	0	1	0	3	4
The importance of co	0	1	0	0	0	1
The institutional fr	0	0	0	0	1	1
The life-cycle of a	0	0	2	0	0	2
The meaning of profi	0	6	1	0	0	7
The municipality	0	1	0	0	0	1
The problem of waste	0	0	0	0	3	3
The problem to creat	0	0	1	0	0	1
The process	0	4	3	0	2	9
The profile of the c	0	0	0	0	1	1
The role of regulati	0	1	0	0	3	4
The role of the faci	0	0	0	0	1	1
The role of the mana	0	0	3	0	0	3
The role of the muni	0	3	0	0	0	3
The role of the wast	0	2	0	0	0	2
The role of trust	0	0	0	0	3	3
The sense of communi	0	0	0	0	1	1
The size of the comm	0	1	1	0	0	2
The story of the sto	0	1	0	0	1	2
transaction costs	0	0	1	0	0	1
TRUST	0	0	0	0	0	0
Types of IS projects	0	3	0	0	0	3
Voluntary	0	1	0	0	0	1
Waste handling compa	0	1	0	0	0	1
Waste in the overall	0	0	0	0	2	2
Waste streams	0	0	3	0	0	3
Water shortage	0	0	0	0	3	3
We learned a lot abo	0	1	0	0	0	1
well structured civi	0	0	0	0	1	1
Why communication wa	0	1	0	0	0	1
Why did it happen in	0	3	0	0	0	3
Widespread of the Ka	0	0	1	0	0	1
Widespread of the pr	0	1	0	0	0	1
Will and choice	0	1	5	0	1	7
Willingness to coope	0	0	1	0	0	1
win-win	0	1	0	0	0	1
working across the f	0	1	1	0	0	2
Would the symbiosis	0	0	0	0	1	1

Totals	0	162	206	0	147	515

6. Network Views

Figure 6.1 Emergence

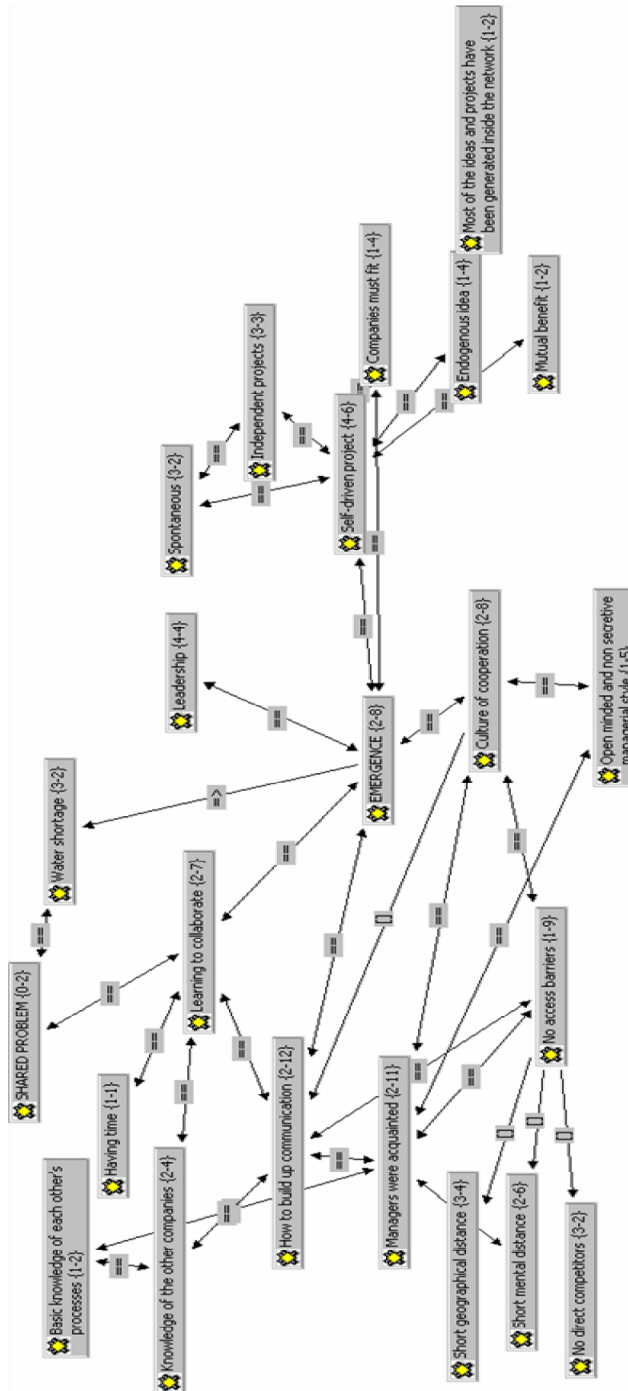


Figure 6.2 Trust

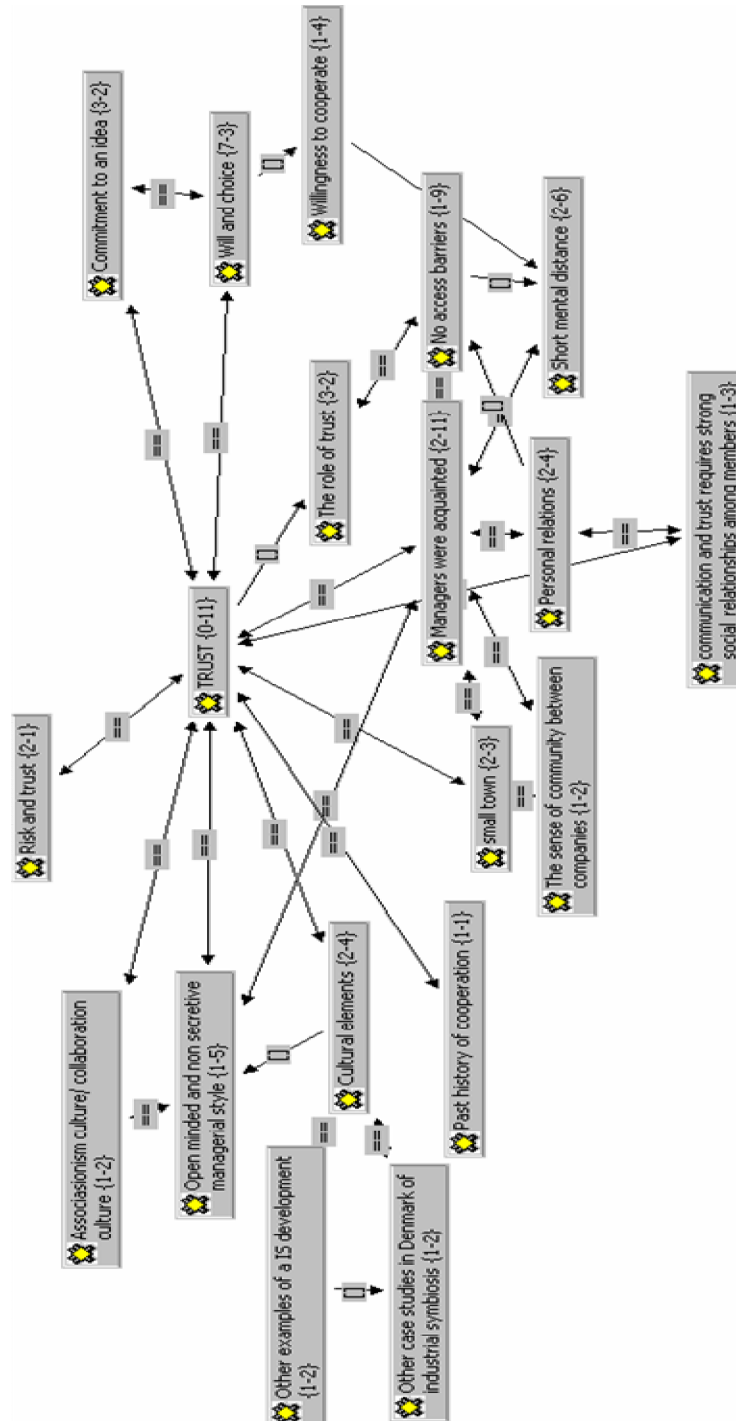


Figure 6.3 Communication

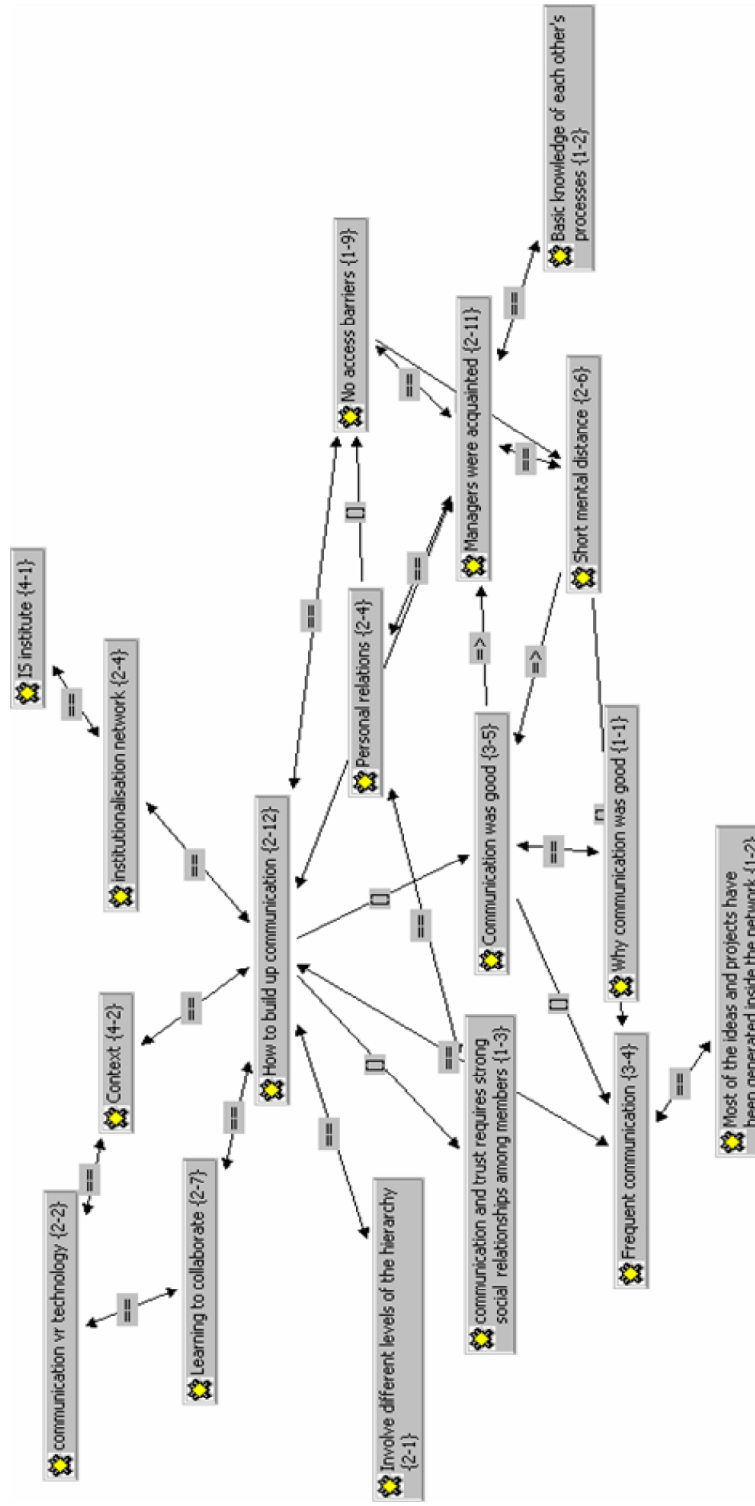


Figure 6.4 Success Factors

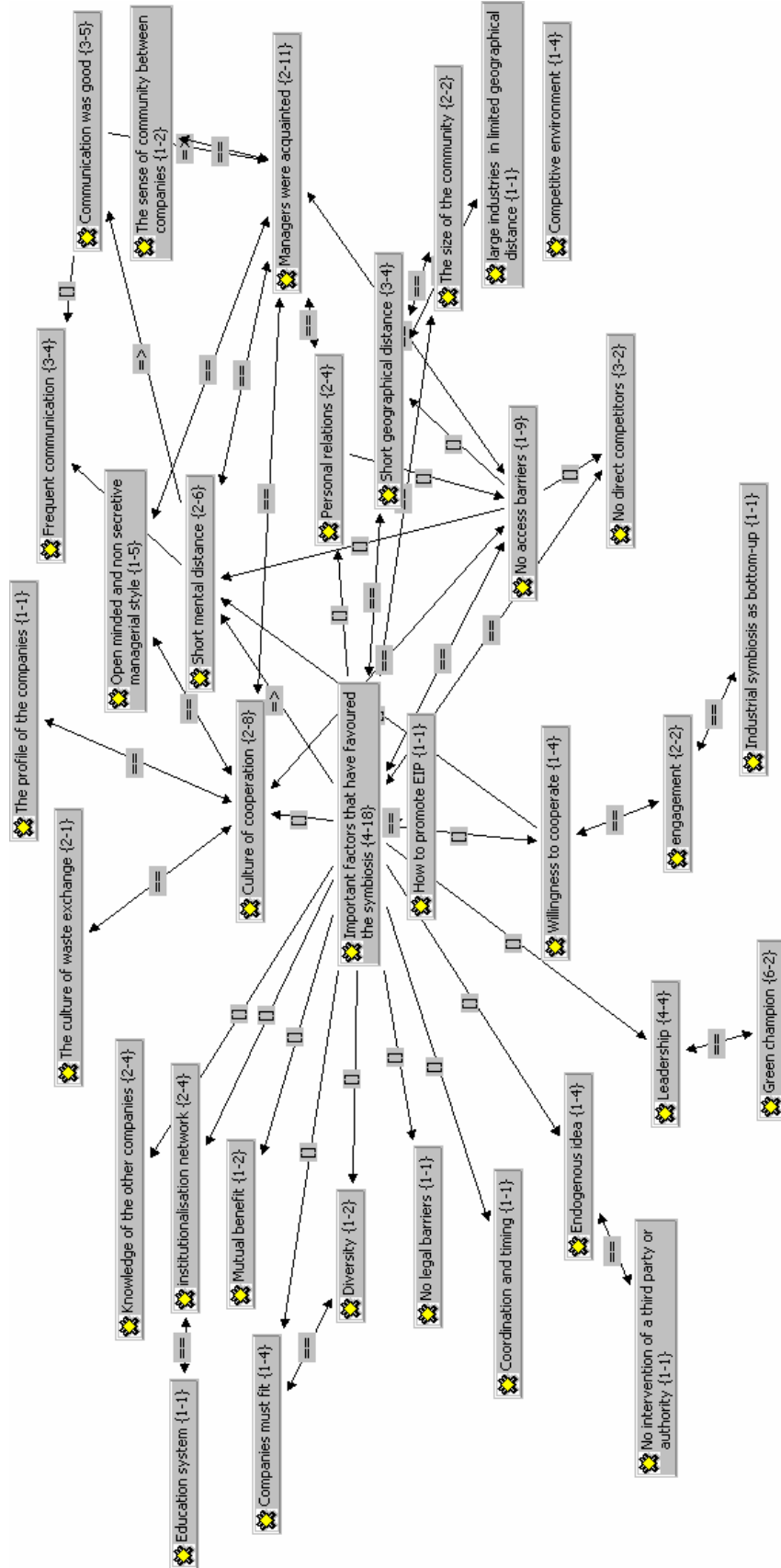
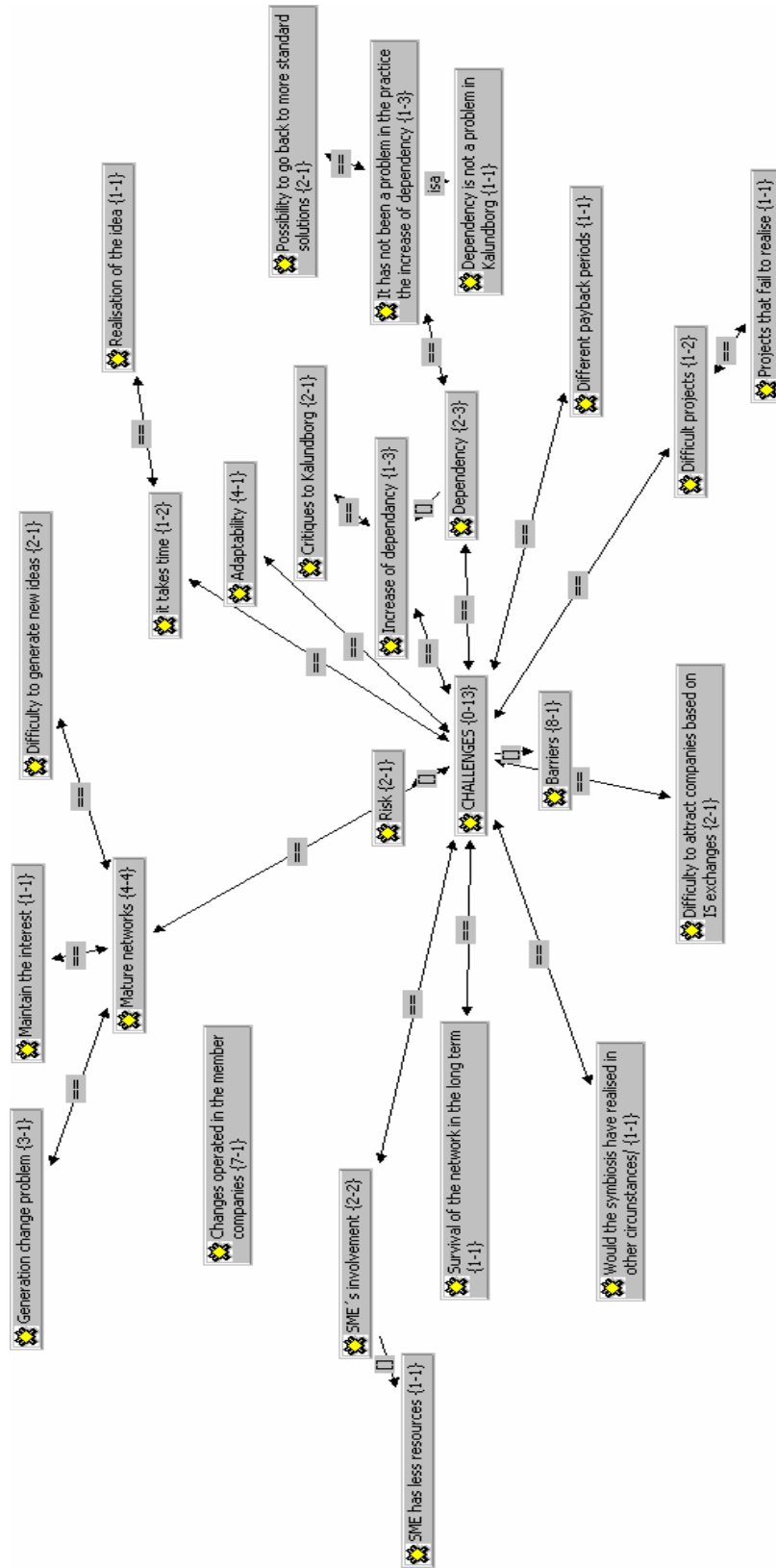


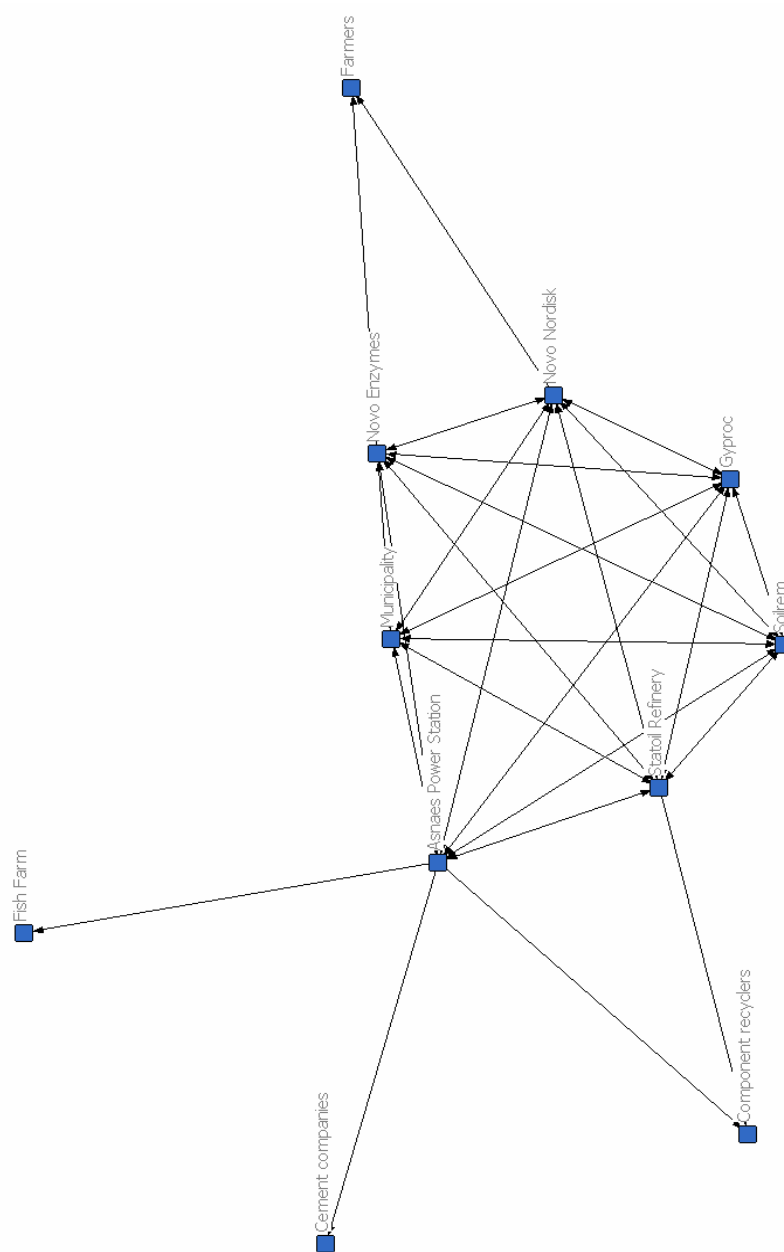
Figure 6.5 Challenges



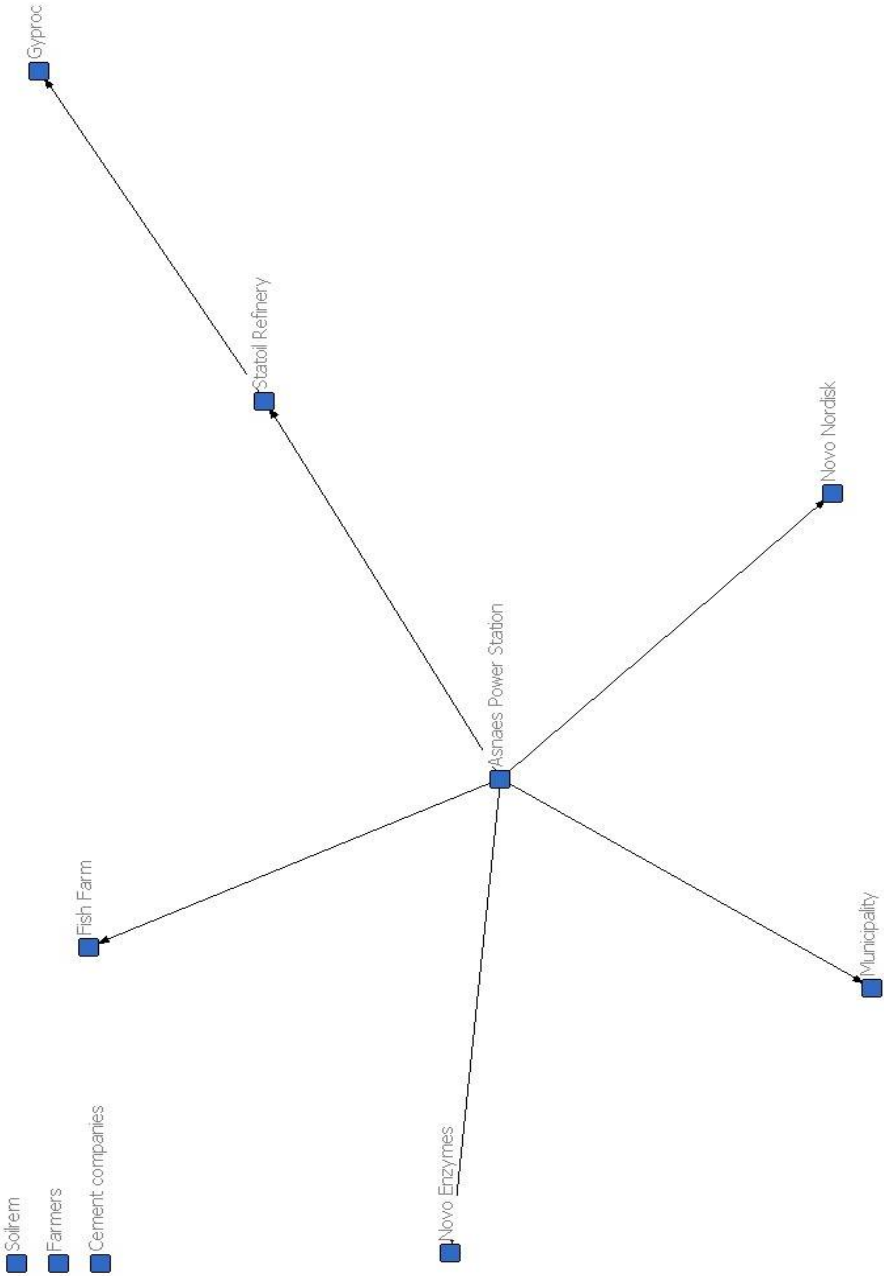
SOCIAL NETWORK ANALYSIS

7. TRANSACTIONAL NETWORKS

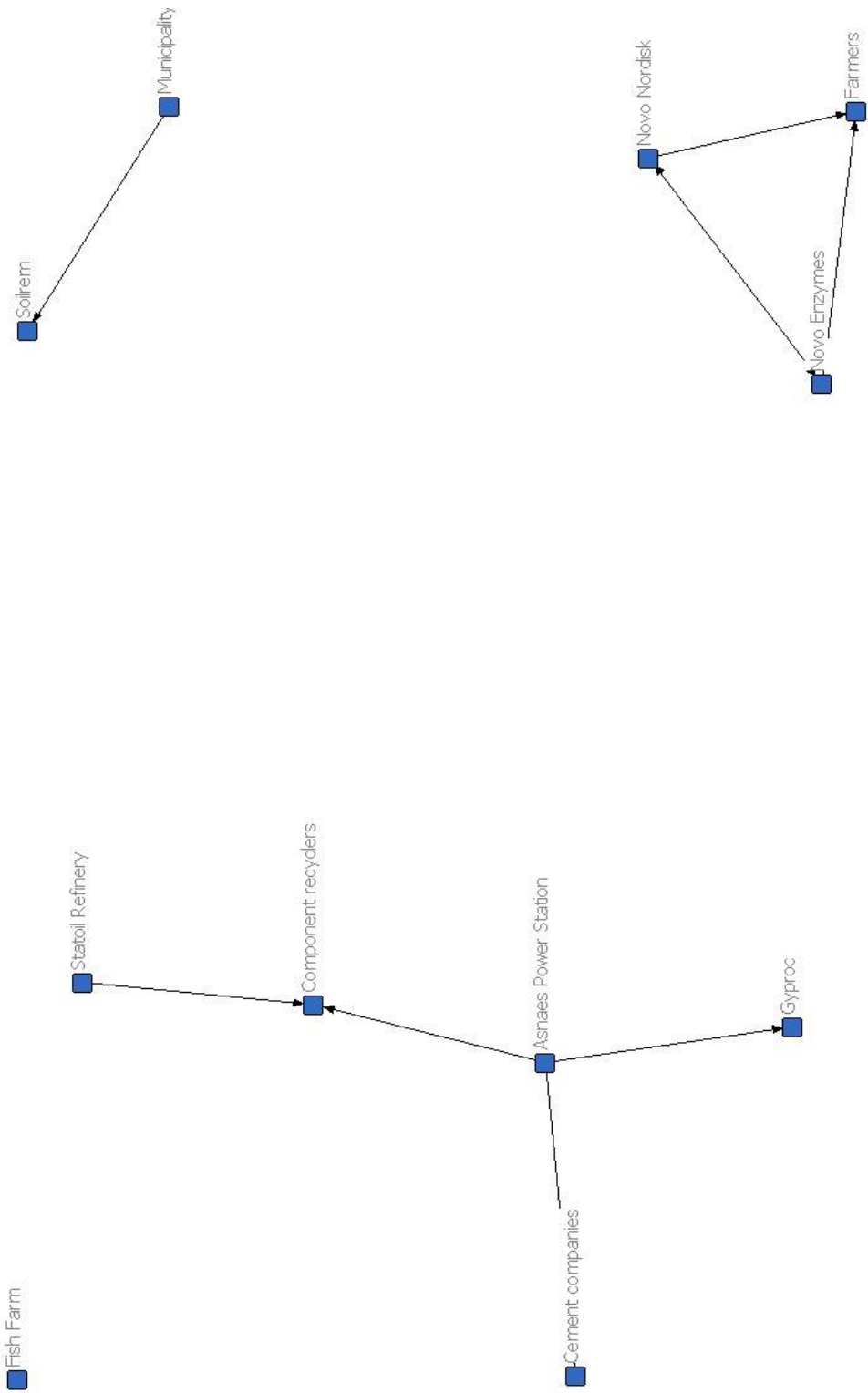
7.1 General Network Diagram (including knowledge and information flows)



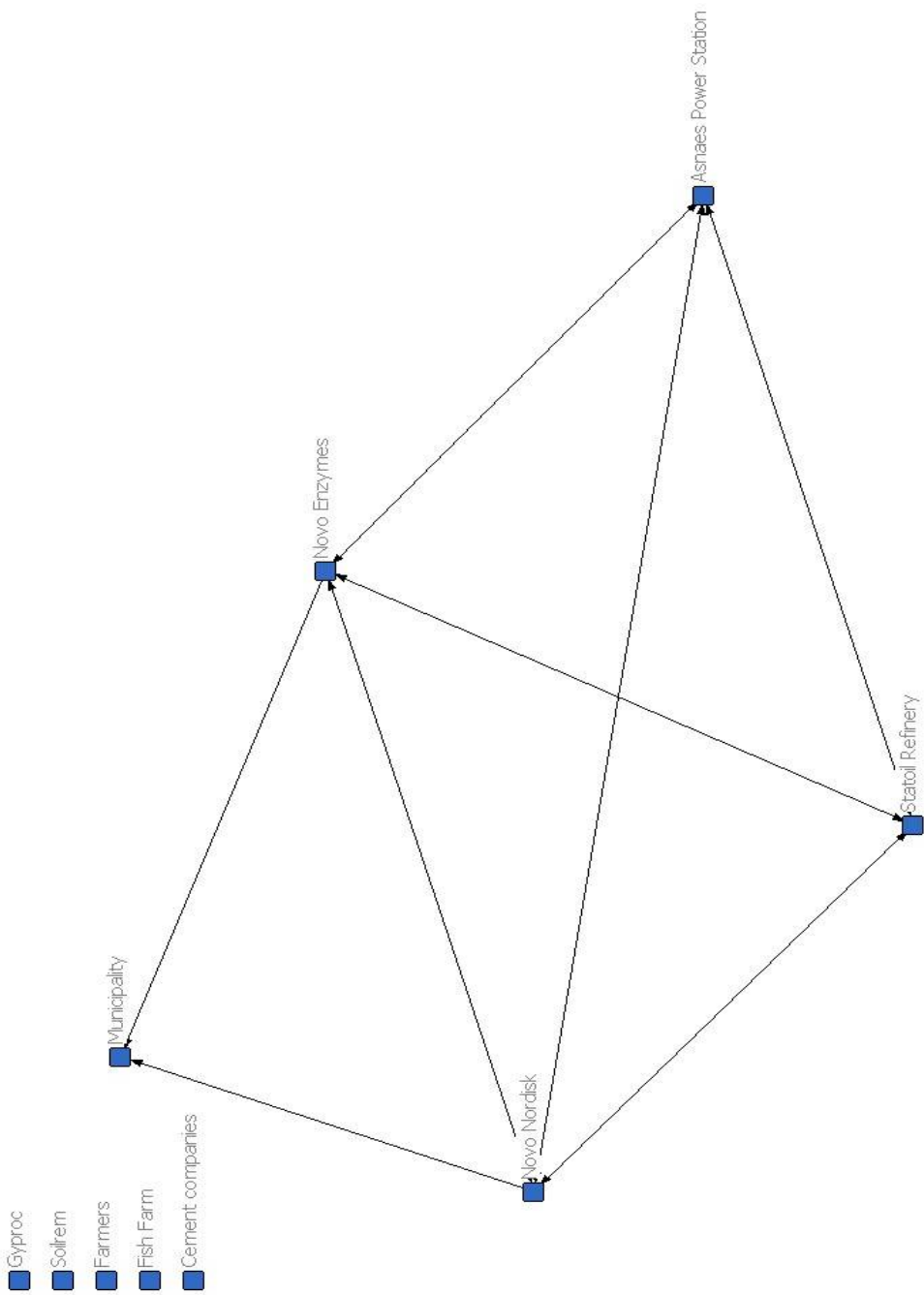
7.2 Energy Network



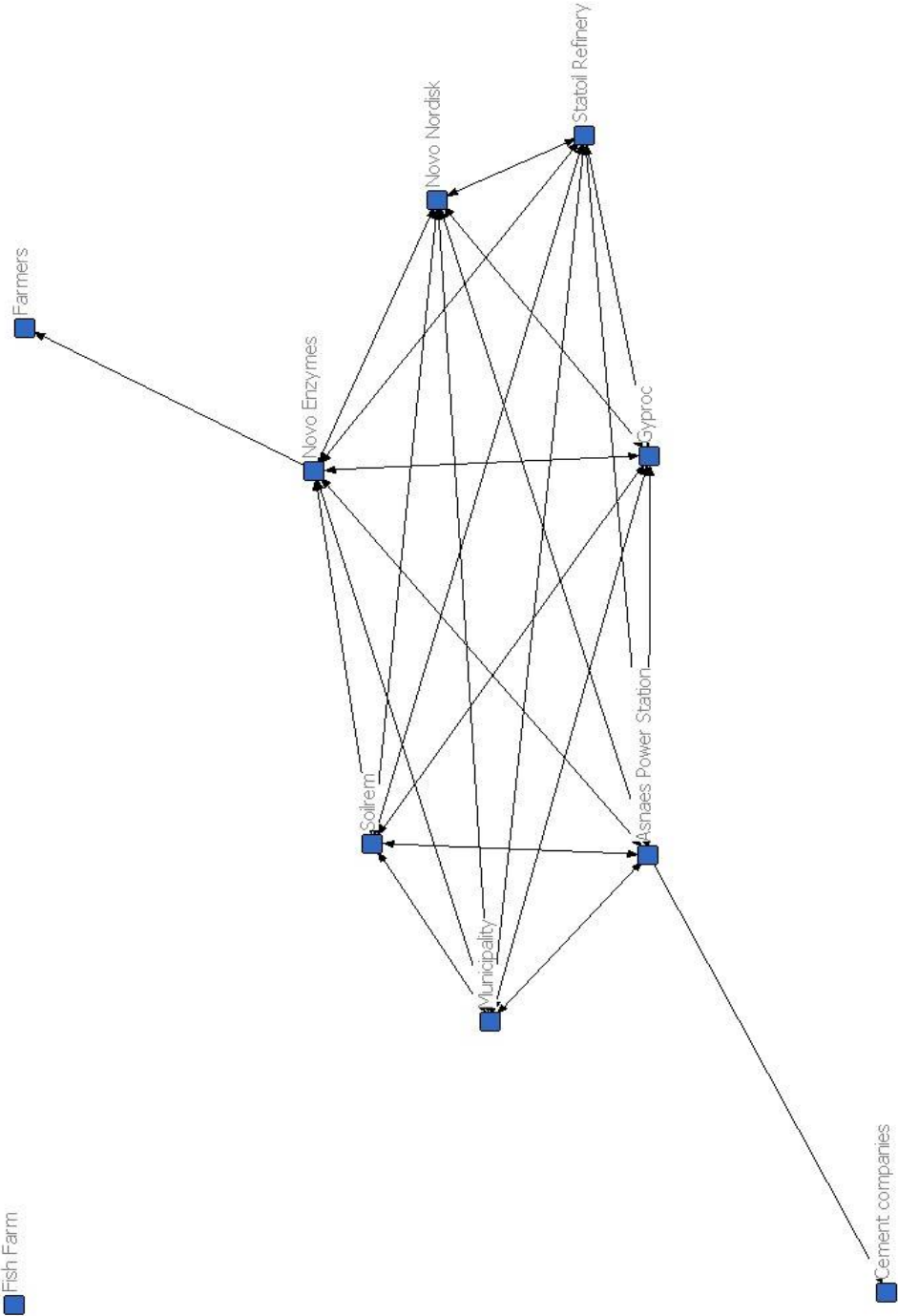
7.3 Material Network



7.4 Water Network



7.5 Knowledge Network



8. OUTPUTS

8.1 Structural Equivalence

PROFILE STRUCTURAL EQUIVALENCE

```
-----
Measure:                      Euclidean Distance
Include transpose              YES
Diagonal:                     Ignore
Use geodesics?               NO
Input dataset:                Kalundborg general (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
general)
```

Structural Equivalence Matrix

Compo	Novo	Novo	Asnae	Stato	Gypro	Soilr	Munic	Farme	Fish	Cemen
-- NovoNor	0.00	1.41	2.45	2.24	2.45	3.00	2.45	2.45	2.65	2.65
2.45 NovoEnz	1.41	0.00	2.45	2.24	2.00	2.65	2.00	2.00	2.24	2.24
2.00 Asnaes	2.45	2.45	0.00	1.73	2.83	3.32	3.16	3.16	3.00	3.00
2.83 Statoil	2.24	2.24	1.73	0.00	2.24	2.83	2.65	2.65	2.45	2.45
2.24 Gyproc	2.45	2.00	2.83	2.24	0.00	1.73	2.00	2.00	1.00	1.00
0.00 Soilrem	3.00	2.65	3.32	2.83	1.73	0.00	1.73	1.73	1.41	1.41
1.73 Municip	2.45	2.00	3.16	2.65	2.00	1.73	0.00	1.41	1.73	1.73
2.00 Farmers	2.45	2.00	3.16	2.65	2.00	1.73	1.41	0.00	1.73	1.73
2.00 FishF	2.65	2.24	3.00	2.45	1.00	1.41	1.73	1.73	0.00	0.00
1.00 Cementc	2.65	2.24	3.00	2.45	1.00	1.41	1.73	1.73	0.00	0.00
1.00 Compon	2.45	2.00	2.83	2.24	0.00	1.73	2.00	2.00	1.00	1.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	3	4	1	2	7	8	6	0	9	5	1
0.000	.	.	.	.	.	.	.	XXX	XXX		
1.000	.	.	.	.	.	.	.	XXXXXXX			
1.414	.	.	XXX	XXX	.			XXXXXXXXX			
1.626	.	.	XXX	XXX	XXXXXXXXXXXXX						
1.732	XXX	XXX	XXX	XXXXXXXXXXXXX							
1.881	XXX	XXX	XXXXXXXXXXXXXXXXX								
2.278	XXX	XXXXXXXXXXXXXXXXXXXXX									
2.575	XXXXXXXXXXXXXXXXXXXXXXXXX										

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\SE)

Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\SEPart)

Running time: 00:00:01
Output generated: 07 Jan 10 11:38:57
Copyright (c) 1999-2008 Analytic Technologies
PROFILE STRUCTURAL EQUIVALENCE

Measure: Euclidean Distance
Include transpose YES
Diagonal: Ignore
Use geodesics? NO
Input dataset: Kalundborg Energy Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Energy Matrix)

Structural Equivalence Matrix

	Novo Cemen	Novo	Asnae	Stato	Gypro	Soilr	Munic	Farme	Fish
- NovoNord.	0.00	0.00	2.00	1.00	1.41	1.00	0.00	1.00	0.00
1.00									
NovoEnz.	0.00	0.00	2.00	1.00	1.41	1.00	0.00	1.00	0.00
Asnaes	2.00	2.00	0.00	2.24	2.45	2.24	2.00	2.24	2.00
Statoil	1.00	1.00	2.24	0.00	1.00	1.41	1.00	1.41	1.00
Gyproc	1.41	1.41	2.45	1.00	0.00	1.00	1.41	1.00	1.41
Soilrem	1.00	1.00	2.24	1.41	1.00	0.00	1.00	0.00	1.00
Municip	0.00	0.00	2.00	1.00	1.41	1.00	0.00	1.00	0.00
Farmers	1.00	1.00	2.24	1.41	1.00	0.00	1.00	0.00	1.00
Fish Farm	0.00	0.00	2.00	1.00	1.41	1.00	0.00	1.00	0.00
Cementco	1.00	1.00	2.24	1.41	1.00	0.00	1.00	0.00	1.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	3	4	5	2	1	7	9	6	8	0
0.000	.	.	.	XXXXXXX	XXXXX					
1.000	.	XXX	XXXXXXXXXXXXXXXX							
1.188	.	XXXXXXXXXXXXXXXXXXXX								
2.192	XXXXXXXXXXXXXXXXXXXX									

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\SEPart)

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 16:00:10
Copyright (c) 1999-2008 Analytic Technologies

```

```

-----
PROFILE STRUCTURAL EQUIVALENCE
-----

```

```

Measure: Euclidean Distance
Include transpose YES
Diagonal: Ignore
Use geodesics? NO
Input dataset: Kalundborg Material Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Material Matrix)

```

```

Structural Equivalence Matrix

```

	Novo	Novo	Asnae	Stato	Gypro	Soilr	Munic	Farme	Fish	Cemen	Compo
NovoNo	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
NovoEn	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
Asnaes	2.45	2.45	0.00	1.41	1.41	2.00	2.00	2.24	1.73	1.41	1.73
Statoi	2.00	2.00	1.41	0.00	1.41	1.41	1.41	1.73	1.00	1.41	1.00
Gyproc	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Soilr	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Munic	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Farmes	1.00	1.00	2.24	1.73	1.73	1.73	1.73	0.00	1.41	1.73	2.00
FishFa	1.73	1.73	1.73	1.00	1.00	1.00	1.00	1.41	0.00	1.00	1.41
Cement	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Compon	2.24	2.24	1.73	1.00	1.00	1.73	1.73	2.00	1.41	1.00	0.00

```

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

```

Level	1	2	8	3	7	6	4	9	5	0	1
0.000	XXX	.	.	XXX	.	.	XXX	.			
1.000	XXXXX	.	XXX	XXX	XXXXX						
1.138	XXXXX	.	XXXXXXXXX	XXXXX							
1.349	XXXXX	.	XXXXXXXXXXXXXXXXX								
1.658	XXXXX	XXXXXXXXXXXXXXXXX									
1.937	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX									

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SEPart)

Running time: 00:00:01
Output generated: 07 Jan 10 16:02:48
Copyright (c) 1999-2008 Analytic Technologies

PROFILE STRUCTURAL EQUIVALENCE

Measure: Euclidean Distance
Include transpose YES
Diagonal: Ignore
Use geodesics? NO
Input dataset: Kalundborg Material Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Material Matrix)

Structural Equivalence Matrix

Compo	Novo	Novo	Asnae	Stato	Gypro	Soilr	Munic	Farme	Fish	Cemen	
NovoNo	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
NovoEn	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
Asnaes	2.45	2.45	0.00	1.41	1.41	2.00	2.00	2.24	1.73	1.41	1.73
Statoil	2.00	2.00	1.41	0.00	1.41	1.41	1.41	1.73	1.00	1.41	1.00
Gyproc	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Soilre	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Munic	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Farmer	1.00	1.00	2.24	1.73	1.73	1.73	1.73	0.00	1.41	1.73	2.00
FishFa	1.73	1.73	1.73	1.00	1.00	1.00	1.00	1.41	0.00	1.00	1.41
Cement	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Compon	2.24	2.24	1.73	1.00	1.00	1.73	1.73	2.00	1.41	1.00	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	1	2	8	3	7	6	4	9	5	0	1
0.000	XXX	.	.	XXX	.	.	XXX	.			
1.000	XXXXX	.	XXX	XXX	XXXXX						

```

1.138  XXXXX . XXXXXXXX XXXXX
1.349  XXXXX . XXXXXXXXXXXXXXXX
1.658  XXXXX XXXXXXXXXXXXXXXX
1.937  XXXXXXXXXXXXXXXXXXXXXXXX

```

```

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SEPart)

```

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 16:02:48
Copyright (c) 1999-2008 Analytic Technologies

```

PROFILE STRUCTURAL EQUIVALENCE

```

-----
Measure:                               Euclidean Distance
Include transpose                       YES
Diagonal:                               Ignore
Use geodesics?                          NO
Input dataset:                           Kalundborg Material Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Material Matrix)

```

Structural Equivalence Matrix

Compo	Novo	Novo	Asnae	Stato	Gypro	Soilr	Munic	Farme	Fish	Cemen	
NovoNor	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
NovoEnz	0.00	0.00	2.45	2.00	2.00	2.00	2.00	1.00	1.73	2.00	2.24
Asnaes	2.45	2.45	0.00	1.41	1.41	2.00	2.00	2.24	1.73	1.41	1.73
Statoil	2.00	2.00	1.41	0.00	1.41	1.41	1.41	1.73	1.00	1.41	1.00
Gyproc	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Soilre	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Munici	2.00	2.00	2.00	1.41	1.41	0.00	0.00	1.73	1.00	1.41	1.73
Farmer	1.00	1.00	2.24	1.73	1.73	1.73	1.73	0.00	1.41	1.73	2.00
FishFa	1.73	1.73	1.73	1.00	1.00	1.00	1.00	1.41	0.00	1.00	1.41
Cement	2.00	2.00	1.41	1.41	0.00	1.41	1.41	1.73	1.00	0.00	1.00
Compon	2.24	2.24	1.73	1.00	1.00	1.73	1.73	2.00	1.41	1.00	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

```

Level   1 2 8 3 7 6 4 9 5 0 1
-----  - - - - - - - - - -
0.000   XXX . . XXX . . XXX .
1.000   XXXXX . XXX XXX XXXXX
1.138   XXXXX . XXXXXXXX XXXXX
1.349   XXXXX . XXXXXXXXXXXXXXX
1.658   XXXXX XXXXXXXXXXXXXXXXX
1.937   XXXXXXXXXXXXXXXXXXXXX

```

```

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\PROGRAM FILES\ANALYTIC TECHNOLOGIES\UCINET
6\DATAFILES\KALUNDBORG\Knowledge\SEPart)

```

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 16:02:48
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```

8.2 Centrality Measures

MULTIPLE CENTRALITY MEASURES

```

-----
Input dataset:           Kalundborg general (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
general)
Output dataset:         Kalundborg general-cent (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
general-cent)
Treat data as:         Auto-detect
Type of scores to output: Normalized

```

Matrix Page 1 is directed? YES

Centrality Measures

Page 1

Between	OutDeg	Indeg	OutBonP	InBonPw	Out2Ste	In2Step	OutARD	InARD	
-									
Novo Nordisk	0.600	0.400	6.172	4.484	1.000	0.300	0.750	0.300	0.085
Novo Enzymes	0.400	0.400	2.564	4.484	0.600	0.300	0.583	0.300	0.019
Asnaes Station	0.900	0.300	6.186	3.172	1.000	0.300	0.900	0.250	0.063
Statoil Refinery	0.600	0.300	6.170	3.172	0.900	0.300	0.733	0.250	0.011
Gyproc	0.100	0.300	0.005	2.632	0.000	0.300	0.000	0.283	0.000
Soilrem	0.100	0.200	0.005	2.081	0.000	0.400	0.000	0.283	0.000
Municipality	0.200	0.400	0.011	5.023	0.100	0.400	0.100	0.350	0.033

Farmers	0.100	0.300	0.005	3.711	0.000	0.400	0.000	0.300	0.000
Fish Farm	0.100	0.200	0.005	1.320	0.000	0.300	0.000	0.233	0.000
Cement companies	0.100	0.200	0.005	1.320	0.000	0.300	0.000	0.233	0.000
Component recyclers	0.100	0.300	0.005	2.632	0.000	0.300	0.000	0.283	0.000

Value of Beta was: 0.291428752719385

Running time: 00:00:01
Output generated: 07 Jan 10 14:00:51
Copyright (c) 1999-2008 Analytic Technologies

FREEMAN'S DEGREE CENTRALITY MEASURES:

Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Kalundborg general (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
 general)

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
3 Asnaes Power Station	8.000	80.000	0.222
2 Novo Enzymes	5.000	50.000	0.139
1 Novo Nordisk	5.000	50.000	0.139
4 Statoil Refinery	5.000	50.000	0.139
7 Municipality	4.000	40.000	0.111
11 Component recyclers	2.000	20.000	0.056
5 Gyproc	2.000	20.000	0.056
8 Farmers	2.000	20.000	0.056
9 Fish Farm	1.000	10.000	0.028
10 Cement companies	1.000	10.000	0.028
6 Soilrem	1.000	10.000	0.028

DESCRIPTIVE STATISTICS

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
1 Mean	3.273	32.727	0.091
2 Std Dev	2.178	21.780	0.061
3 Sum	36.000	360.000	1.000
4 Variance	4.744	474.380	0.004
5 SSQ	170.000	17000.000	0.131
6 MCSSQ	52.182	5218.182	0.040
7 Euc Norm	13.038	130.384	0.362
8 Minimum	1.000	10.000	0.028
9 Maximum	8.000	80.000	0.222

Network Centralization = 57.78%
 Heterogeneity = 13.12%. Normalized = 4.43%

Actor-by-centrality matrix saved as dataset FreemanDegree

 Running time: 00:00:01
 Output generated: 07 Jan 10 14:01:55
 Copyright (c) 2002-9 Analytic Technologies

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Kalundborg general (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
 general)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 71.333

		1	2
		Betweenness	nBetweenness
		-----	-----
3	Asnaes Power Station	8.667	9.630
1	Novo Nordisk	7.667	8.519
7	Municipality	4.000	4.444
4	Statoil Refinery	2.000	2.222
2	Novo Enzymes	1.667	1.852
6	Soilrem	0.000	0.000
5	Gyproc	0.000	0.000
8	Farmers	0.000	0.000
9	Fish Farm	0.000	0.000
10	Cement companies	0.000	0.000
11	Component recyclers	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	2.182	2.424
2	Std Dev	3.079	3.421
3	Sum	24.000	26.667
4	Variance	9.482	11.706
5	SSQ	156.667	193.416
6	MCSSQ	104.303	128.769
7	Euc Norm	12.517	13.907
8	Minimum	0.000	0.000
9	Maximum	8.667	9.630

Network Centralization Index = 7.93%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 07 Jan 10 14:08:38
 Copyright (c) 1999-2008 Analytic Technologies

CLOSENESS CENTRALITY

```

-----
-----
Input dataset:           Kalundborg general (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
general)
Method:                 Geodesic paths only (Freeman Closeness)
Output dataset:         Closeness (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)
  
```

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.
 The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

	1	2	3	4
outCloseness	inFarness	outFarness	inCloseness	
6 Soilrem	65.000	110.000	15.385	9.091
7 Municipality	71.000	100.000	14.085	10.000
8 Farmers	72.000	110.000	13.889	9.091
11 Componentre	73.000	110.000	13.699	9.091
5 Gyproc	73.000	110.000	13.699	9.091
9 Fish Farm	74.000	110.000	13.514	9.091
10 Cementco	74.000	110.000	13.514	9.091
2 Novo Enzymes	80.000	21.000	12.500	47.619
1 Novo Nordisk	80.000	15.000	12.500	66.667
3 Asnaes	81.000	12.000	12.346	83.333
4 Statoil	81.000	16.000	12.346	62.500

Statistics

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
1 Mean	74.909	74.909	13.407	29.515
2 Std Dev	4.833	44.661	0.889	27.922
3 Sum	824.000	824.000	147.474	324.664
4 Variance	23.355	1994.628	0.790	779.648
5 SSQ	61982.000	83666.000	1985.828	18158.580
6 MCSSQ	256.909	21940.908	8.693	8576.122
7 Euc Norm	248.962	289.251	44.563	134.754
8 Minimum	65.000	12.000	12.346	9.091
9 Maximum	81.000	110.000	15.385	83.333

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Kalundborg\Closeness)

Running time: 00:00:01

FREEMAN'S DEGREE CENTRALITY MEASURES:

Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Kalundborg Energy Matrix (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
 Energy Matrix)

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
3 Asnaes Power Station	5.000	55.556	0.417
4 Statoil Refinery	2.000	22.222	0.167
1 Novo Nordisk	1.000	11.111	0.083
2 Novo Enzymes	1.000	11.111	0.083
5 Gyproc	1.000	11.111	0.083
7 Municipality	1.000	11.111	0.083
9 Fish Farm	1.000	11.111	0.083
6 Soilrem	0.000	0.000	0.000
8 Farmers	0.000	0.000	0.000
10 Cement companies	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
1 Mean	1.200	13.333	0.100
2 Std Dev	1.400	15.556	0.117
3 Sum	12.000	133.333	1.000
4 Variance	1.960	241.975	0.014
5 SSQ	34.000	4197.531	0.236
6 MCSSQ	19.600	2419.753	0.136
7 Euc Norm	5.831	64.788	0.486
8 Minimum	0.000	0.000	0.000
9 Maximum	5.000	55.556	0.417

Network Centralization = 52.78%
 Heterogeneity = 23.61%. Normalized = 15.12%

Actor-by-centrality matrix saved as dataset FreemanDegree

 Running time: 00:00:01
 Output generated: 07 Jan 10 15:41:13
 Copyright (c) 2002-9 Analytic Technologies

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Kalundborg Energy Matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg Energy Matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 9.000

		1	2
		Betweenness	nBetweenness
		-----	-----
4	Statoil Refinery	1.000	1.389
1	Novo Nordisk	0.000	0.000
3	Asnaes Power Station	0.000	0.000
2	Novo Enzymes	0.000	0.000
5	Gyproc	0.000	0.000
6	Soilrem	0.000	0.000
7	Municipality	0.000	0.000
8	Farmers	0.000	0.000
9	Fish Farm	0.000	0.000
10	Cement companies	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	0.100	0.139
2	Std Dev	0.300	0.417
3	Sum	1.000	1.389
4	Variance	0.090	0.174
5	SSQ	1.000	1.929
6	MCSSQ	0.900	1.736
7	Euc Norm	1.000	1.389
8	Minimum	0.000	0.000
9	Maximum	1.000	1.389

Network Centralization Index = 1.39%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 07 Jan 10 15:48:31
 Copyright (c) 1999-2008 Analytic Technologies

CLOSENESS CENTRALITY

```
-----
-----
Input dataset:           Kalundborg Energy Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Energy Matrix)
Method:                 Geodesic paths only (Freeman Closeness)
Output dataset:         Closeness (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)
```

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.

The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
5 Gyproc	73.000	90.000	12.329	10.000
2 Novo Enzymes	81.000	90.000	11.111	10.000
1 Novo Nordisk	81.000	90.000	11.111	10.000
4 Statoil Refinery	81.000	81.000	11.111	11.111
7 Municipality	81.000	90.000	11.111	10.000
9 Fish Farm	81.000	90.000	11.111	10.000
6 Soilrem	90.000	90.000	10.000	10.000
8 Farmers	90.000	90.000	10.000	10.000
3 Asnaes	90.000	37.000	10.000	24.324
10 Cement companies	90.000	90.000	10.000	10.000

Statistics

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
1 Mean	83.800	83.800	10.788	11.544
2 Std Dev	5.564	15.829	0.733	4.273
3 Sum	838.000	838.000	107.884	115.435
4 Variance	30.960	250.560	0.538	18.260
5 SSQ	70534.000	72730.000	1169.282	1515.130
6 MCSSQ	309.600	2505.600	5.380	182.596
7 Euc Norm	265.582	269.685	34.195	38.925
8 Minimum	73.000	37.000	10.000	10.000
9 Maximum	90.000	90.000	12.329	24.324

Network centralization not computed for unconnected graphs
Output actor-by-centrality measure matrix saved as dataset Closeness
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\Closeness)

FREEMAN'S DEGREE CENTRALITY MEASURES:

Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Kalundborg Material Matrix (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
 Material Matrix)

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
3 Asnaes Power Station	3.000	30.000	0.188
2 Novo Enzymes	2.000	20.000	0.125
1 Novo Nordisk	2.000	20.000	0.125
11 Component recyclers	2.000	20.000	0.125
8 Farmers	2.000	20.000	0.125
5 Gyproc	1.000	10.000	0.063
7 Municipality	1.000	10.000	0.063
4 Statoil Refinery	1.000	10.000	0.063
6 Soilrem	1.000	10.000	0.063
10 Cement companies	1.000	10.000	0.063
9 Fish Farm	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

	1	2	3
	Degree	NrmDegree	Share
	-----	-----	-----
1 Mean	1.455	14.545	0.091
2 Std Dev	0.782	7.820	0.049
3 Sum	16.000	160.000	1.000
4 Variance	0.612	61.157	0.002
5 SSQ	30.000	3000.000	0.117
6 MCSSQ	6.727	672.727	0.026
7 Euc Norm	5.477	54.772	0.342
8 Minimum	0.000	0.000	0.000
9 Maximum	3.000	30.000	0.188

Network Centralization = 18.89%
 Heterogeneity = 11.72%. Normalized = 2.89%

Actor-by-centrality matrix saved as dataset FreemanDegree

Running time: 00:00:01
 Output generated: 07 Jan 10 15:37:37
 Copyright (c) 2002-9 Analytic Technologies

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Kalundborg Material Matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg Material Matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 0.000

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Novo Nordisk	0.000	0.000
2	Novo Enzymes	0.000	0.000
3	Asnaes Power Station	0.000	0.000
4	Statoil Refinery	0.000	0.000
5	Gyproc	0.000	0.000
6	Soilrem	0.000	0.000
7	Municipality	0.000	0.000
8	Farmers	0.000	0.000
9	Fish Farm	0.000	0.000
10	Cement companies	0.000	0.000
11	Component recyclers	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	0.000	0.000
2	Std Dev	0.000	0.000
3	Sum	0.000	0.000
4	Variance	0.000	0.000
5	SSQ	0.000	0.000
6	MCSSQ	0.000	0.000
7	Euc Norm	0.000	0.000
8	Minimum	0.000	0.000
9	Maximum	0.000	0.000

Network Centralization Index = 0.00%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 07 Jan 10 15:49:56
 Copyright (c) 1999-2008 Analytic Technologies

CLOSENESS CENTRALITY

```
-----
-----
Input dataset:           Kalundborg Material Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Material Matrix)
Method:                 Geodesic paths only (Freeman Closeness)
Output dataset:         Closeness (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)
```

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.

The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
11 Component	90.000	110.000	11.111	9.091
8 Farmers	90.000	110.000	11.111	9.091
2 Novo Enzymes	100.000	90.000	10.000	11.111
1 Novo Nordisk	100.000	90.000	10.000	11.111
5 Gyproc	100.000	110.000	10.000	9.091
10 Cement comp	100.000	110.000	10.000	9.091
6 Soilrem	100.000	110.000	10.000	9.091
4 Statoil	110.000	100.000	9.091	10.000
7 Municipality	110.000	100.000	9.091	10.000
3 Asnaes	110.000	80.000	9.091	12.500
9 Fish Farm	110.000	110.000	9.091	9.091

Statistics

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
1 Mean	101.818	101.818	9.871	9.933
2 Std Dev	7.158	10.285	0.713	1.113
3 Sum	1120.000	1120.000	108.586	109.268
4 Variance	51.240	105.785	0.508	1.239
5 SSQ	114600.000	115200.000	1077.492	1099.031
6 MCSSQ	563.636	1163.636	5.593	13.629
7 Euc Norm	338.526	339.411	32.825	33.152
8 Minimum	90.000	80.000	9.091	9.091
9 Maximum	110.000	110.000	11.111	12.500

Network centralization not computed for unconnected graphs
Output actor-by-centrality measure matrix saved as dataset Closeness
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\Closeness)

FREEMAN'S DEGREE CENTRALITY MEASURES:

```

-----
-----
Diagonal valid?          NO
Model:                  SYMMETRIC
Input dataset:          Kalundborg Water Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Water Matrix)
    
```

		1	2	3
		Degree	NrmDegree	Share
-----		-----	-----	-----
1	Novo Nordisk	4.000	44.444	0.250
2	Novo Enzymes	4.000	44.444	0.250
3	Asnaes Power Station	3.000	33.333	0.188
4	Statoil Refinery	3.000	33.333	0.188
7	Municipality	2.000	22.222	0.125
6	Soilrem	0.000	0.000	0.000
5	Gyproc	0.000	0.000	0.000
8	Farmers	0.000	0.000	0.000
9	Fish Farm	0.000	0.000	0.000
10	Cement companies	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

		1	2	3
		Degree	NrmDegree	Share
-----		-----	-----	-----
1	Mean	1.600	17.778	0.100
2	Std Dev	1.685	18.725	0.105
3	Sum	16.000	177.778	1.000
4	Variance	2.840	350.617	0.011
5	SSQ	54.000	6666.666	0.211
6	MCSSQ	28.400	3506.173	0.111
7	Euc Norm	7.348	81.650	0.459
8	Minimum	0.000	0.000	0.000
9	Maximum	4.000	44.444	0.250

Network Centralization = 33.33%
Heterogeneity = 21.09%. Normalized = 12.33%

Actor-by-centrality matrix saved as dataset FreemanDegree

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 15:40:20
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```


FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Kalundborg Water Matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg Water Matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 8.000

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Novo Nordisk	1.000	1.389
2	Novo Enzymes	1.000	1.389
3	Asnaes Power Station	0.000	0.000
4	Statoil Refinery	0.000	0.000
5	Gyproc	0.000	0.000
6	Soilrem	0.000	0.000
7	Municipality	0.000	0.000
8	Farmers	0.000	0.000
9	Fish Farm	0.000	0.000
10	Cement companies	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	0.200	0.278
2	Std Dev	0.400	0.556
3	Sum	2.000	2.778
4	Variance	0.160	0.309
5	SSQ	2.000	3.858
6	MCSSQ	1.600	3.086
7	Euc Norm	1.414	1.964
8	Minimum	0.000	0.000
9	Maximum	1.000	1.389

Network Centralization Index = 1.23%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 07 Jan 10 15:50:49
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CLOSENESS CENTRALITY

```

-----
Input dataset:           Kalundborg Water Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Water Matrix)
Method:                 Geodesic paths only (Freeman Closeness)
Output dataset:        Closeness (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)
  
```

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.

The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
7 Municipality	56.000	90.000	16.071	10.000
1 Novo Nordisk	63.000	54.000	14.286	16.667
3 Asnaes	63.000	55.000	14.286	16.364
4 Statoil Refinery	63.000	55.000	14.286	16.364
2 Novo Enzymes	63.000	54.000	14.286	16.667
6 Soilrem	90.000	90.000	10.000	10.000
5 Gyproc	90.000	90.000	10.000	10.000
8 Farmers	90.000	90.000	10.000	10.000
9 Fish Farm	90.000	90.000	10.000	10.000
10 Cement companies	90.000	90.000	10.000	10.000

Statistics

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
1 Mean	75.800	75.800	12.321	12.606
2 Std Dev	14.337	17.394	2.376	3.193
3 Sum	758.000	758.000	123.214	126.061
4 Variance	205.560	302.560	5.644	10.197
5 SSQ	59512.000	60482.000	1574.617	1691.093
6 MCSSQ	2055.600	3025.600	56.441	101.965
7 Euc Norm	243.951	245.931	39.681	41.123
8 Minimum	56.000	54.000	10.000	10.000
9 Maximum	90.000	90.000	16.071	16.667

Network centralization not computed for unconnected graphs
Output actor-by-centrality measure matrix saved as dataset Closeness
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Kalundborg\Closeness)

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 15:45:58
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```

FREEMAN'S DEGREE CENTRALITY MEASURES:

```

-----
-----
Diagonal valid?          NO
Model:                  SYMMETRIC
Input dataset:          Kalundborg Knowledge Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Knowledge Matrix)
  
```

	1	2	3
	Degree	NrmDegree	Share
3 Asnaes Power Station	7.000	77.778	0.152
2 Novo Enzymes	7.000	77.778	0.152
1 Novo Nordisk	6.000	66.667	0.130
4 Statoil Refinery	6.000	66.667	0.130
5 Gyproc	6.000	66.667	0.130
6 Soilrem	6.000	66.667	0.130
7 Municipality	6.000	66.667	0.130
8 Farmers	1.000	11.111	0.022
10 Cement companies	1.000	11.111	0.022
9 Fish Farm	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

	1	2	3
	Degree	NrmDegree	Share
1 Mean	4.600	51.111	0.100
2 Std Dev	2.615	29.059	0.057
3 Sum	46.000	511.111	1.000
4 Variance	6.840	844.444	0.003
5 SSQ	280.000	34567.898	0.132
6 MCSSQ	68.400	8444.444	0.032
7 Euc Norm	16.733	185.924	0.364
8 Minimum	0.000	0.000	0.000
9 Maximum	7.000	77.778	0.152

Network Centralization = 33.33%
Heterogeneity = 13.23%. Normalized = 3.59%

Actor-by-centrality matrix saved as dataset FreemanDegree

```

-----
Running time: 00:00:01
Output generated: 07 Jan 10 15:38:17
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```

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Kalundborg Knowledge Matrix
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Kalundborg\Kalundborg Knowledge Matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 48.000

		1	2
		Betweenness	nBetweenness
		-----	-----
3	Asnaes Power Station	6.000	8.333
2	Novo Enzymes	6.000	8.333
1	Novo Nordisk	0.000	0.000
4	Statoil Refinery	0.000	0.000
5	Gyproc	0.000	0.000
6	Soilrem	0.000	0.000
7	Municipality	0.000	0.000
8	Farmers	0.000	0.000
9	Fish Farm	0.000	0.000
10	Cement companies	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	1.200	1.667
2	Std Dev	2.400	3.333
3	Sum	12.000	16.667
4	Variance	5.760	11.111
5	SSQ	72.000	138.889
6	MCSSQ	57.600	111.111
7	Euc Norm	8.485	11.785
8	Minimum	0.000	0.000
9	Maximum	6.000	8.333

Network Centralization Index = 7.41%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 07 Jan 10 15:49:21
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CLOSENESS CENTRALITY

 Input dataset: Kalundborg Knowledge Matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg Knowledge Matrix)
 Method: Geodesic paths only (Freeman Closeness)
 Output dataset: Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.
 The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

	1	2	3	4
outCloseness	inFarness	outFarness	inCloseness	
8 Farmers	33.000	90.000	27.273	10.000
10 Cement companies	33.000	90.000	27.273	10.000
2 Novo Enzymes	36.000	19.000	25.000	47.368
4 Statoil Refinery	36.000	20.000	25.000	45.000
1 Novo Nordisk	36.000	20.000	25.000	45.000
6 Soilrem	36.000	20.000	25.000	45.000
7 Municipality	36.000	20.000	25.000	45.000
3 Asnaes	36.000	19.000	25.000	47.368
5 Gyproc	36.000	20.000	25.000	45.000
9 Fish Farm	90.000	90.000	10.000	10.000

Statistics

	1	2	3	4
	inFarness	outFarness	inCloseness	outCloseness
1 Mean	40.800	40.800	23.955	34.974
2 Std Dev	16.443	32.211	4.737	16.374
3 Sum	408.000	408.000	239.545	349.737
4 Variance	270.360	1037.560	22.440	268.095
5 SSQ	19350.000	27022.000	5962.604	14912.534
6 MCSSQ	2703.600	10375.600	224.401	2680.949
7 Euc Norm	139.104	164.384	77.218	122.117
8 Minimum	33.000	19.000	10.000	10.000
9 Maximum	90.000	90.000	27.273	47.368

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Closeness)

 Running time: 00:00:01

8.3 Core-Periphery Structure

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Kalundborg general (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
general)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CoreClasses)
Starting fitness: 0.836
Final fitness: 0.836
Core/Periphery Class Memberships:

```

- 1: Novo Nordisk Novozymes Asnaes Power station Statoil refinery
- 2: Gyproc Soilrem Municipality Farmers Fish farm Cement companies
Component recyclers

Blocked Adjacency Matrix

		1 1										
		1	2	3	4	5	6	7	8	9	0	1
		N	N	A	S	G	S	M	F	F	C	C
1	Novo Nordisk	|	1	1	1	|		1	1			|
2	Novo Enzymes	|	1			|		1	1			|
3	Asnaes Power Station	|	1	1	1	|	1	1	1	1	1	|
4	Statoil Refinery	|	1	1	1	|	1				1	|
5	Gyproc	|				|						|
6	Soilrem	|				|						|
7	Municipality	|				|	1					|
8	Farmers	|				|						|
9	Fish Farm	|				|						|
10	Cement companies	|				|						|
11	Component recyclers	|				|						|

Density matrix

	1	2
1	0.833	0.393
2	0.000	0.024

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Kalundborg Energy Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Energy Matrix)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CoreClasses)

```

Starting fitness: 0.552
Final fitness: 0.552

Core/Periphery Class Memberships:

- 1: Novo Nordisk Asnaes Power station Statoil refinery
- 2: Novo Enzymes Gyproc Soilrem Municipality Farmers Fish farm
Cement companies

Blocked Adjacency Matrix

		1	4	3	2	5	6	7	8	9	0
		N	S	A	N	G	S	M	F	F	C
1	Novo Nordisk										
4	Statoil Refinery				1						
3	Asnaes Power Station	1	1		1		1	1			
2	Novo Enzymes										
5	Gyproc										
6	Soilrem										
7	Municipality										
8	Farmers										
9	Fish Farm										
10	Cement companies										

Density matrix

	1	2
1	0.333	0.190
2	0.000	0.000

SIMPLE CORE/PERIPHERY MODEL

Input dataset: Kalundborg Material Matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg Material Matrix)
 Type of data: Positive
 Fitness measure: CORR
 Density of core-to-periphery ties:
 Number of iterations: 50
 Population size: 100
 Output partition: CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\CorePartition)
 Output clusters: CoreClasses (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\CoreClasses)

Starting fitness: 0.516

Final fitness: 0.516

Core/Periphery Class Memberships:

- 1: Novo Nordisk Novo Enzymes
- 2: Asnaes Power station Statoil refinery Gyproc Soilrem Municipality Farmers Fish farm Cement companies Component recyclers

Blocked Adjacency Matrix

		1 1										
		1	2	3	4	5	6	7	8	9	0	1
		N	N	A	S	G	S	M	F	F	C	C
1	Novo Nordisk	|	1	|					1			|
2	Novo Enzymes	|	1	|					1			|
3	Asnaes Power Station	|		|		1				1	1	|
4	Statoil Refinery	|		|							1	|
5	Gyproc	|		|								|
6	Soilrem	|		|								|
7	Municipality	|		|			1					|
8	Farmers	|		|								|
9	Fish Farm	|		|								|
10	Cement companies	|		|								|
11	Component recyclers	|		|								|

Density matrix

	1	2
1	1.000	0.111
2	0.000	0.069

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Kalundborg Water Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Water Matrix)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:      CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CoreClasses)

```

Starting fitness: 1.000
Final fitness: 1.000

Core/Periphery Class Memberships:

- 1: Novo Nordisk Novo Enzymes Asnaes Power station Statoil refinery
- 2: Gyproc Soilrem Municipality Farmers Fish farm Cement companies

Blocked Adjacency Matrix

		1	2	3	4	5	6	7	8	9	0
		N	N	A	S	G	S	M	F	F	C
1	Novo Nordisk		1	1	1				1		
2	Novo Enzymes	1		1	1				1		
3	Asnaes Power Station	1	1		1						
4	Statoil Refinery	1	1	1							
5	Gyproc										
6	Soilrem										
7	Municipality										
8	Farmers										
9	Fish Farm										
10	Cement companies										

Density matrix

	1	2
1	1.000	0.083
2	0.000	0.000

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Kalundborg Knowledge Matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Kalundborg\Kalundborg
Knowledge Matrix)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Kalundborg\CoreClasses)

```

Starting fitness: 1.000
Final fitness: 1.000

Core/Periphery Class Memberships:

- 1: Novo Nordisk Novo Enzymes Asnaes Power station Statoil refinery Gyproc Soilrem Municipality
- 2: Farmers Fish farm Cement companies

Blocked Adjacency Matrix

		1	2	3	4	5	6	7	8	9	0
		N	N	A	S	G	S	M	F	F	C
1	Novo Nordisk	1	1	1	1	1	1	1			
2	Novo Enzymes	1	1	1	1	1	1	1	1		
3	Asnaes Power Station	1	1	1	1	1	1	1		1	
4	Statoil Refinery	1	1	1	1	1	1	1			
5	Gyproc	1	1	1	1	1	1	1			
6	Soilrem	1	1	1	1	1	1	1			
7	Municipality	1	1	1	1	1	1	1			
8	Farmers										
9	Fish Farm										
10	Cement companies										

Density matrix

	1	2
1	1.000	0.095
2	0.000	0.000

Appendix C

Sagunto: Analysis outputs

QUALITATIVE ANALYSIS

1. Hermeneutic Unit- All Objects

HU: SAGUNTO1

File: [R:\PHD\SAGUNTO1.hpr5]

Edited by: Super

Date/Time: 10/05/2010 17:12:43

List of all objects

HUs

===

SAGUNTO1

Primary Docs

=====

P 1: AL.rtf

P 2: AM.rtf

P 3: BS.rtf

P 4: CEV.rtf

P 5: FT.rtf

P 6: FD.rtf

P 7: TY.rtf

P 8: PK.rtf

Quotations

=====

- 1:1 Pues son grasas, aceites usado.. (1:1)
- 1:2 ese es como productor de resid.. (2:4)
- 1:3 entonces existe un convenio en.. (10:14)
- 1:4 luego aqui tienes una pequenya.. (14:16)
- 1:5 En esta fabrica de cemento, la.. (21:22)
- 1:6 Tenemos una fabrica de cemento.. (29:29)
- 1:7 En primer lugar serian una sel.. (35:39)
- 1:8 La seleccion de materias prima.. (40:44)
- 1:9 Principalmente en Sagunto. de .. (46:48)
- 1:10 aqui la piedra esta todavia en.. (49:51)
- 1:11 Ahi es donde utilizabais antes.. (52:52)
- 1:12 Ahi es donde utilizabais antes.. (52:55)
- 1:13 Esto es una especie como de ta.. (57:62)
- 1:14 Entonces aqui hay un foco de C.. (64:66)
- 1:15 al salir del horno el material.. (66:66)
- 1:16 Vale? en el enfriador, nosotros.. (67:70)
- 1:17 : claro, estos, como es una co.. (78:81)
- 1:18 Entonces si, aqui estamos util.. (87:87)
- 1:19 Que sucede? que ahora por aqui.. (89:90)
- 1:20 8vamos a ver para evitar todo .. (94:108)

1:21 ahora mismo estaremos en torno.. (110:111)

1:22 Hay un poco de todo hay empres.. (114:120)

1:23 normalmente si, a ver, por las.. (122:127)

1:24 no, en el caso de los aceites .. (129:136)

1:25 las fabricas siempre tienen do.. (140:149)

1:26 son muy sencillas, no deja de .. (151:160)

1:27 bueno una vez que tienes el cl.. (161:168)

1:28 clinker, este anyo estamos ven.. (170:174)

1:29 de la autorizacion ambiental, .. (178:178)

1:30 bueno la IPPC ha puesto alguno.. (183:184)

1:31 lafargue siempre ha invertido .. (184:184)

1:32 La ISO 14.000 es del 2002 ISO .. (187:188)

1:33 en emisiones difusas se han in.. (190:211)

1:34 En las fabricas de cemento tie.. (211:224)

1:35 si, nosotros en la fabrica ten.. (228:235)

1:36 En este caso tambien. Normalme.. (238:249)

1:37 porque tambien es importante e.. (242:245)

1:38 Y , por estos materiales pagai.. (250:255)

1:39 mira, de cenizas volantes esta.. (257:262)

1:40 Y ya estamos hablando de tarea.. (262:266)

1:41 Si, eso seria los filtros hibr.. (269:278)

1:42 Esto son diferentes filtros po.. (278:295)

1:43 a ver problemas de incumplimie.. (297:303)

1:44 estas hablando de la ISO 14,00.. (307:321)

1:45 al fin y al cabo una fabrica s.. (311:315)

1:46 despues es otra manera que tie.. (309:311)

1:47 el tema de tener el clinker un.. (314:316)

1:48 y es una manera de tenerlo tod.. (317:321)

1:49 si claro la normativa de gases.. (324:334)

1:50 or que ahora que porcentaje es.. (335:342)

1:51 REACH esa tambien os afecta? A.. (343:348)

1:52 el tema de las mejoras medioam.. (352:358)

1:53 si, como cualquier otra invers.. (360:368)

1:54 lo de la sustitucion de materi.. (369:379)

1:55 eh,... dependiendo. Las invers.. (381:383)

1:56 Pero hay otras inversiones que.. (383:394)

1:57 dependiendo. Las inversiones q.. (382:394)

1:58 el agua se utiliza solamente p.. (396:403)

1:59 si el consumo de agua son rela.. (402:403)

1:60 Tenemos entre las plantas espa.. (409:421)

1:61 si, nuestro proceso productivo.. (423:430)

1:62 a ver de todas las empresas qu.. (434:437)

1:63 el tema del transporte es muy .. (439:440)

1:64 para los proximos tres anyos l.. (442:447)

1:65 El tema de ruido es un tema qu.. (451:451)

2:1 Esta empresa esta dentro del g.. (3:5)

2:2 Entonces esta planta es una pl.. (8:15)

2:3 Entonces esta planta es una pl.. (8:9)

2:4 Hay diferentes productos y hay.. (10:12)

2:5 a plantas galvanizadoras propi.. (11:14)

2:6 pues vienen de dos procedencia.. (17:19)

2:7 Las bobinas normalmente vienen.. (19:25)

2:8 Pues todas las bobinas llegari.. (25:27)

2:9 y de ahi pasarian a lo que den.. (27:31)

2:10 aqui hay que destacar un compo.. (32:38)

2:11 Entonces esto es una planta qu.. (39:42)

2:12 Despues de aqui esta fabrica d.. (42:45)

2:13 Aqui tenemos un almacen que er.. (45:46)

2:14 Tanto del residuo como de los .. (42:45)

2:15 despues de este proceso de dec.. (46:52)

2:16 Pues consiste en hacer pasar l.. (54:58)

2:17 si, entonces tendríamos cinco .. (60:63)

2:18 no, aqui lo que se utiliza, (65:72)

2:19 Bien, pues una vez salen de aq.. (72:76)

2:20 el paso siguiente seria el alm.. (76:77)

2:21 pues tendríamos unos hornos de.. (77:92)

2:22 Es un proceso discontinuo, una.. (92:94)

2:23 pues en el proceso de recocido.. (96:105)

2:24 Luego esta linea, como todas l.. (105:112)

2:25 pues es un proceso muy simple,.. (120:126)

2:26 No, no son peligrosos, hacemos.. (128:130)

2:27 pues nosotros intentamos valor.. (132:144)

2:28 Desde el punto de vista de asp.. (144:148)

2:29 desde el punto de vista de gen.. (149:158)

2:30 y una vez que acabamos lo que .. (159:170)

2:31 y una vez ha pasado el temple .. (171:172)

2:32 no, tanto Soldmed como Thyssen.. (175:185)

2:33 pues actualmente el sector del.. (187:194)

2:34 aqui tenemos en esta fabrica t.. (193:199)

2:35 l producto de electrozincado e.. (208:222)

2:36 Si, este desde el punto de vis.. (224:231)

2:37 el agua de toda la fabrica se .. (233:241)

2:38 Cumplimos con toda la legislac.. (279:280)

2:39 no, el aceite no nos dejan reu.. (330:338)

2:40 si, pues bueno, principalmente.. (341:345)

2:41 chatarra lo que ocurre es que .. (346:349)

2:42 porque ademas es una chatarra .. (348:352)

2:43 Luego seria a pequenya escala... (352:355)

2:44 desde mayo del 2001 con la 14,.. (365:369)

2:45 si, son bastante profesionales.. (371:373)

2:46 Hay sistemas de calidad, es el.. (385:389)

2:47 de momento no, lo que si que s.. (391:393)

2:48 pues de momento no ha habido g.. (399:404)

2:49 de momento no, porque incluso .. (406:408)

2:50 por nuestra principal comunica.. (411:421)

2:51 Pues lo que es la...desde que .. (436:462)

2:52 Nosotros tenemos desde hace va.. (444:451)

2:53 las inversiones normalmente so.. (465:469)

2:54 las inversiones, la propia pro.. (471:473)

2:55 si, cualquier tipo de inversio.. (475:477)

2:56 pero normalmente las inversion.. (475:479)

2:57 Normalmente, bueno, fijandonos.. (483:491)

2:58 el grupo que esta medioambient.. (501:506)

2:59 Bueno a nivel de disenyo de lo.. (511:525)

2:60 yo creo que fue una decision d.. (527:528)

2:61 y de politica del grupo, la po.. (530:536)

2:62 pues no, hemos intentado una v.. (542:543)

2:63 : pues no, de momento no tenem.. (545:546)

2:64 ueno, si con las empresas si, .. (549:554)

2:65 pues con Thyssen evidentemente.. (557:560)

2:66 con Asland no intercambias nin.. (541:547)

2:67 si, gestionamos las aguas de l.. (563:569)

2:68 normalmente como se estudian t.. (575:579)

2:69 Normalmente todas las propuest.. (580:583)

2:70 normalmente se cumple mas del .. (585:607)

2:71 Este va relacionado siempre a .. (609:618)

2:72 si suele ser personal, los rec.. (621:626)

2:73 si, normalmente los envian por.. (628:645)

2:74 ha ayudado y mucho y te digo p.. (651:665)

2:75 No, hay muchas que vienen de l.. (667:672)

2:76 si que puede ocurrir que media.. (673:678)

2:77 Bueno me has dicho que colabor.. (690:690)

2:78 Si, bueno, normalmente hay jor.. (691:696)

2:79 Bueno aqui tienes una vista de.. (725:732)

2:80 si que hay posibilidad pero lo.. (741:745)

2:81 Esta es una imagen de la tuber.. (757:761)

2:82 no, no, en su dia se estudio n.. (774:778)

3:1 La empresa Bossal espanya no t.. (1:1)

3:2 si, son actividades que trabaj.. (13:13)

3:3 el trabajo te lo dice que real.. (45:49)

3:4 bueno como quieras, hemos vist.. (126:134)

3:5 A nivel de grupo no se estable.. (136:136)

3:6 es para la planta nuestra...pe.. (143:147)

3:7 el diretor de medioambiente, p.. (149:153)

3:8 luego por ejemplo directrices .. (154:157)

3:9 bueno, en principio, la ISO 14.. (184:195)

3:10 El plan de minimización que se p.. (203:204)

3:11 sí, ahora sí, tengo una notifi.. (207:215)

3:12 sí y si la administración me l.. (222:234)

3:13 yo no estaba entonces en medio.. (322:328)

3:14 más que como criterio de elecc.. (447:452)

3:15 bueno, no se, inicialmente es .. (411:417)

3:16 inspecciones ninguna, cuando vi.. (398:402)

4:1 bueno, ahora, te comentare. Ha.. (9:18)

4:2 y es bueno el típico decreto q.. (23:30)

4:3 pero bueno, sale el decreto ha.. (31:38)

4:4 en el caso del molino nuestro .. (112:122)

4:5 El problema no suele estar ahí.. (123:124)

4:6 si el calor, parte del calor s.. (194:209)

4:7 sí, los residuos que se genera.. (218:229)

4:8 sí, claro es una de las cosas .. (231:239)

4:9 bueno hay una empresa que es l.. (241:256)

4:10 se está tramitando ahora la IS.. (372:390)

4:11 no de cara a clientes sino de .. (392:392)

4:12 la ISO 14000 no el producto qu.. (394:406)

4:13 El planteamiento de la empresa.. (416:429)

4:14 sí, bueno, como la matriz que .. (432:438)

4:15 bueno, ya temas, es decir, el .. (440:454)

4:16 ahí hay dos...normalmente los .. (457:478)

4:17 temas sobre inversión, se gest.. (480:509)

4:18 El mejor no es necesariamente .. (529:536)

4:19 sí, hay requisitos del ayuntam.. (560:572)

4:20 Para lo nuestro,...Union Fenos.. (575:595)

4:21 Si, con Fertiberia la relacion.. (611:619)

4:22 el plan de emergencia, se ha e.. (621:649)

4:23 No No, se intento con Fertiber.. (651:670)

4:24 medioambiental, aqui por lo qu.. (694:780)

4:25 Todos los sistemas de gestion .. (782:797)

4:26 el objetivo es la ISO, directa.. (801:851)

5:1 pero ahora estamos inmersos en.. (88:97)

5:2 la gran verdad es que en Europ.. (100:105)

5:3 , si generamos vapor y ese vap.. (107:117)

5:4 Mira, este canal, en este tram.. (224:234)

5:5 aqui tecnologia BAT en este re.. (269:279)

5:6 nosotros en el tema de la IPPC.. (334:341)

5:7 Claro porque tenia que ver con.. (343:368)

5:8 amos a ver, con Conselleria, y.. (377:411)

6:1 Entonces desde el anyo 2000 qu.. (7:8)

6:2 Eso fue ...en cada una de plan.. (9:9)

6:3 Nosotros en el 2002 es cuando .. (9:13)

6:4 Entonces tenemos el tema de la.. (14:15)

6:5 Tambien hemos integrado en la .. (15:17)

6:6 acido agotado que bueno todo e.. (29:30)

6:7 Entonces aqui si que se genera.. (30:33)

6:8 Si la tratamos nosotros, ten e.. (37:39)

6:9 en el sector nuestro lo que es.. (41:42)

6:10 una linea de plastificado. En .. (42:42)

6:11 Esta en marcha y montado, ento.. (42:42)

6:12 no, se hace a traves de consul.. (46:46)

6:13 Nosotros tenemos un programa a.. (46:46)
6:14 para los pallets, ahora lo ver.. (56:56)
6:15 basicamente el tema legal, el .. (56:56)
6:16 basicamente el tema legal, el .. (56:56)
6:17 Tu la madera puedes decir buen.. (56:59)
6:18 :no, lo mas lento de resolver .. (61:61)
6:19 Cuando hay un tema, aqui hay u.. (61:62)
6:20 no, lo mas lento de resolver s.. (61:61)
6:21 entonces tienes que valorarlas.. (64:67)
6:22 si, igual,si es un tema legal,.. (69:69)
6:23 la certificacion medioambienta.. (75:86)
6:24 de cara a la empresa es un gas.. (80:82)
6:25 de cara a la empresa es un gas.. (80:86)
6:26 si mas interna, de desarrollo,.. (88:88)
6:27 nosotros al final del anyo se .. (92:92)
6:28 no, la que hacemos aqui es cad.. (94:97)
6:29 bueno el otro dia mismo el coo.. (100:101)
6:30 hay una empresa que ahora mism.. (107:110)
6:31 puntualmente podemos tener cos.. (110:112)
6:32 Si, pero en cualquier lado tam.. (114:115)
6:33 Entonces mas reuniones la verd.. (123:123)
6:34 Entonces nosotros habiamos pen.. (125:126)
6:35 no, ahi la forma de actuar nue.. (133:134)
6:36 Entonces claro ese seria un pr.. (144:144)
6:37 dentro de los VOCs tenemos dos.. (137:144)
6:38 Eso no podemos hacerlo, bueno .. (148:149)
6:39 claro al final te encuentras c.. (149:149)

- 7:1 Bueno yo de la depuradora no s.. (24:24)
- 7:2 Eso es desengrasado entonces e.. (17:21)
- 7:3 bueno, pues la certificacion n.. (107:115)
- 7:4 bueno aqui realmente nuevas te.. (121:131)
- 7:5 A nosotros no nosotros lo teni.. (133:136)
- 7:6 nuestro ejercicio empieza en s.. (150:156)
- 7:7 Luego tenemos como lo habras v.. (170:177)
- 7:8 Bueno si realmente si consegui.. (257:263)
- 7:9 pues yo diria aqui realmente t.. (267:279)
- 7:10 , latas de zinc que eso tambie.. (322:326)
- 7:11 as latas nos las compras, no p.. (328:329)
- 7:12 colaboracion en aspectos medio.. (361:361)
- 7:13 si que pertenecemos a FEMEVAL,.. (362:366)
- 8:1 he was very cautious about the.. (15:15)
- 8:2 Any data transfer is penalized.. (16:16)
- 8:3 In any case, the company have .. (18:18)
- 8:4 Moreover, the company is ready.. (18:18)
- 8:5 When he is asked what are the .. (19:19)
- 8:6 As a consequence of the restri.. (21:21)
- 8:7 Moreover, collaboration in env.. (23:23)
- 8:8 The company representative had.. (24:24)
- 8:9 Although this position towards.. (25:25)
- 8:10 Second uses and recovery of ma.. (25:25)
- 8:11 The environmental manager toge.. (25:25)
- 8:12 PVB, it is fully recycled - PP.. (41:44)
- 8:13 With regard to varnish and sol.. (52:52)

Codes

=====

A regional regulation classify scrap as by-product {1-1}

Absence of regular inspections by regulatory bodies {1-0}

Acid regeneration was considered but finally rejected for the costt of the investment {1-0}

Administrative process is long and complex {2-1}

Advantages of valorisation of fuels Vs inceneration {2-2}

Alternative fuels {1-1}

Alternative liquid fuels {1-1}

Alternative raw materials {1-1}

Another company runs the waster treatment plant and by-products generated {1-0}

Approval of environmental objectives {1-0}

Approval of new inputs: environmental requirements {1-0}

Assignment of roles {1-0}

ATmospheric emission control technologies: filters {1-0}

Atmospheric emission reduction {1-0}

Atmospheric emissions {1-0}

Atmospheric emissions and recovery of acid {1-0}

Atmospheric emissions control technologies {2-0}

ATmospheric emissions: oily mist from tandem {1-0}

Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers {1-1}

BAT adopted throughout the process {2-0}

BATs {2-1}

better control of environmental aspects {1-0}

biomass {1-0}

Bottom-up approach: environmental improvements {2-0}

By-product clinker {1-0}

By-product lamination: full hard {1-0}

By-product: Clinker {1-0}

By-product: Full hard {1-0}

By-product: iron oxide {1-0}

By-products and recycled waste streams {1-0}

By-products: full-hard {1-0}

By-products: sludge with high content in iron to be used in agriculture {1-0}

By product: Scrap (to be melt in blast furnaces) {1-0}

Cement grinding and IPPC {1-0}

Certifications {1-0}

CHALLENGES {0-7}

Changes in production induced by changes in environmental regulations {2-1}

Climate Change Commitment: CO2 Emissions cap {1-2}

co-generation was not feasible option but recovery of heat {2-0}

Cogeneration {1-0}

Cold laminated coils warehouse {1-0}

Cold rolled steel coils {1-0}

Collaboration with companies that formerly belonged to the same group {3-3}

Collaboration with other plants to discuss regulatory issues {1-1}

Collaboration within the group {7-0}

Combination of internal and external drivers {1-0}

Communication policy prohibits information exchange with external agents {2-2}

Communication with regulatory bodies/agents {1-1}

Communication with admin is generally mediated by a external consultancy firm {1-0}

Competence regulation and communication policy of the company does not allow exchange of information with third actors {1-3}

Conditioning of waste to be used as alternative fuel {1-0}

Confidentiality policy {1-3}

Conflict with municipal authorities {1-3}

Connexion to other nodes: metal2 {1-0}

Continous improvement {1-0}

Continuos process {1-0}

Control of CO2 emissions and Emissions Reduction Commitment {1-4}

Cooperation is not based on frequent communication {1-0}

Costs and benefits of environmental management {1-2}

CSR and environmental investments {3-3}

CSR and license to operate {1-2}

Decisions concerning regulatory permits/ requirements are taken by the group {1-0}

Defining environmental objectives {5-1}

Destiny of galvanised products: car industry {1-0}

Differences between electrozincate and hot dip galvanising {1-0}

Different providers of main raw materials {1-0}

Difficulty to find suitable waste streams in high volumes {1-2}

Difussed emissions are more difficult to control {1-0}

Documentation and compliance with regulatory requirements {1-0}

Drivers for adoption EMS {9-0}

Each plant within the group has the responsibility to keep up to date with all requirements {1-0}

Easy to control atmospheric emissions within limits set by regulations {1-2}

ECONOMIC BARRIERS {0-3}

Economic benefits/savings of better environmental management {2-4}

Economic cost of using sea water for production is to high {1-0}

Elimination of chromium VI {1-0}

EMS and environmental investments {2-1}

EMS documentation {1-0}

EMS process {1-0}

EMS: advantages {4-0}

Environmental committee has periodical meetings {1-0}

Environmental communication and training {1-0}

Environmental decision making {2-5}

Environmental impacts of etching {1-0}

Environmental impacts: electrozincate {1-0}

Environmental investments {8-1}

Environmental investments and licence to operate {2-0}

Environmental investments are generally approved while production investments have to compete with other plants {5-2}

Environmental management as a cost for the company {1-0}

Environmental objectives {2-0}

Environmental permit approval follow very long administrative processes {3-2}

Environmental programme and internal revision of the system {1-0}

Environmental ranking of plants {1-0}

Environmental regulation in Europe may compromise profitability of industrial companies {1-3}

Environmental regulations and competitive position {1-2}

Etching {1-0}

etching steel coils warehouse {1-0}

Examination and analytical procedures of alternative raw materials {1-0}

Examination of new raw materials {1-0}

Exploration of potential IS exchanges {1-1}

External driver: community {3-0}

External drivers: car industry {4-0}

External drivers: clients don't require ISO 14,001 {1-1}

Factory open days {1-0}

Final product: cold laminated steel {1-0}

fly ash for grinding {1-0}

Future environmental actions/investments {5-6}

Future regulations {3-3}

good communication {1-0}

Groundwater wells {1-0}

Having the ISO 14,001 does not guarantee that your clients are going to buy you {2-3}

Hot dip galvanising {1-0}

Identification of potential IS exchange ties: Alternative raw materials {1-3}

Implications of the enforcement of the IPPC {6-1}

Importance of alternative fuels % {1-0}

Improvements generated as a consequence of the EMS {1-0}

Inspections {2-0}

Integral Environmental Authorisation {2-0}

Integration of systems {2-0}

Integration in the community {1-1}

Integration of environmental and worker security policies {1-0}

intermediary warehouse to regulate the process {1-0}

Internal audit {1-0}

Internal driver {4-0}

Internal environmental objectives go far beyond environmental regulation {2-2}

Introduction of environmental principle in investment's approval procedure {4-3}

Investments' approval procedure {3-2}

IPPC regulation: revision of the regulation including cement grinding companies {1-0}

IS by-product: Zinc pot {2-0}

IS exchange didn't work {1-4}

IS exchange: minimum volume {1-2}

IS exchange: old blast furnace {1-0}

IS exchange: sludge to cement company {2-1}

IS flow: shared use of waste treatment plant {1-0}

IS obstacle: sludge does not comply with chemical requirements defined by the cement factory {2-2}

IS opportunities with neighbouring companies {13-0}

IS opportunities: economic benefits {1-0}

IS opportunities: infrastructures sharing {3-0}

IS: Maintenance oils are valorised by an external waste manager {1-0}

IS: recovery of solvents {1-0}

ISO 14,001 {1-0}

ISO 14,001 certification {2-0}

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation {1-1}

It is difficult to define new objectives and target after a few years {1-1}

Lack of technical capability of municipal authorities {2-2}

Leading environmental positioning {1-2}

Low priority of environmental issues {1-0}

Main activity of the company {1-0}

Main alternative raw materials: ceramics, fly ash {1-0}

Main clients: car industry, domestic appliances and constructions {1-0}

Main environmental impacts: lamination and re-cooking {1-0}

Main environmental investments {1-6}

Main fuels {2-0}

Main production process: Lamination {3-0}

Main raw materials come from companies in the area {1-0}

main waste streams {3-0}

Management of alternative liquid fuels {1-0}

Management of waste streams {1-3}

Material balances {1-0}

Maximizing recycling rates {2-1}

Mutual control and communication with neighbouring companies {2-1}

Need to go beyond current EMS towards the integration of eco-efficiency {1-1}

Negotiation of prices for alternative fuels {1-0}

Negotiation of prices of alternative raw materials {1-0}

No collaboration with neighbouring companies {2-4}

No collaboration within the group {1-1}

No communication at all with neighbouring companies {1-2}

No communication with external agents {1-3}

No regular communication with regulatory bodies {1-1}

Only information exchange no material exchange {2-0}

Operative decisions are taken by the plant {1-2}

OPPORTUNITIES {0-7}

Opportunities to introduce new waste streams into the production process {1-0}

Organisation and assignation of environmental roles: cooperation within the group {2-0}

Origin of raw materials {1-0}

Other low volume waste streams {1-0}

Paper and cardboard: external recyclers {1-0}

Payback time for environmental investments {1-2}

Periodical meetings of environmental committee {2-0}

Plant cross comparisons and case studies {1-0}

Plant was already certified before it was a requirement of clients {1-0}

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption {1-2}

Possible use of sludge in cement companies {1-0}

Proactive attitude to comply with all environmental requirements {2-7}

Production phase: clinker grinding {1-0}

Production phase: cooling {1-0}

Production phase: electrozincate {1-0}

Production phase: grinding {1-0}

Production phase: homegenization of raw metrials {1-0}

Production phase: oven cooking {2-0}

Production phase: selection of raw materials {1-0}

Production process: phases {1-0}

Production process: re-cooking {1-0}

Production process: surface tempering {1-0}

Proposal of improvements {1-1}

Re-cooked coil warehouse {1-0}

REACH {3-1}

recovery of acid from fume cleaning system {1-0}

Reduction of CO2 emissions by substitution of fuels using biomass {1-2}

Reduction of total emissions {1-0}

Regeneration of acid within the plant {1-0}

Regenerative thermal oxidation for the control of VOC's {1-0}

Regulation is preventing wood recycling {2-1}

Regulatory barriers to waste exchange {1-2}

Regulatory bodies do not have qualified personnel for the enforcement of IPPC {1-2}

Relationship with regulatory bodies {1-0}

relevance given to Environmental management {1-0}

Relevance of alternative raw materials % {1-0}

Relevance of environmental principles in the strategy of the company {1-3}

Reluctancy to collaborate with neighbouring companies {1-0}

Reluctancy to provide information in future investments or future regulations {1-0}

Restrictive communication policy hinder any attempt to collaborate with neighbouring companies {2-0}

Reuse of treated waste water for dissolution of lime {1-0}

RoHs {1-1}

Role of the group environmental coordinator {1-0}

Security {1-0}

Self control and monitoring of emissions and effluents {1-0}

Several types of cement products {1-0}

sludge {1-0}

Sludge cannot be used as by-product due to its classification as a waste {1-1}

Sludge: non hazardous {1-0}

Some benefits are generated from the reuse and recycle of waste streams {1-3}

Some environmental investments won't payback {1-5}

Some informal communication with neighbouring companies {1-0}

Some occasional informal contacts with neighbouring plants in environmental issues {2-5}

Substitution of chromium VI and Nickel {1-0}

Substitution of raw materials for waste streams reduced cost of production {1-0}

Successful achievement of environmental objectives {1-0}

Tax reduction for environmental investments {1-2}

TECHNICAL BARRIERS {0-3}

The direction of the group set as a priority to be up to date with all environmental requirements {1-6}

The process of approval of environmental investments {2-4}

There is a budget for environmental improvements {1-1}

There is no restriction to environmental investments required by regulation {2-5}

Transport costs {1-2}

Transport of raw materials and final products {1-0}

Transport of waste streams {1-1}

Trust based on secrecy and confidentiality {1-1}

Types of waste streams {2-0}

Use of oil emulsion in lamination {1-0}

Use of waste streams is limited by valorisation installations and waste market {1-0}

Use of water: cooling of gases and refrigeration {1-0}

Valorisation installations: requirements {1-0}

Valorisation of waste and IS exchanges payback {1-0}

Warehouse warm rolled coil {1-0}

Waste management {2-0}

waste manager and waste producer {1-0}

Waste managers and responsibility {1-1}

Waste regulation and IS exchanges {4-12}

Waste regulation has prevented possible by-product exchanges {3-1}

Waste stream: exhausted acid {1-0}

Waste treatment plant {1-0}

waste treatment plant process {1-0}

Waste use and types of water quality {1-0}

waste valorisation in cement companies {1-0}

We are prepared for the future {1-0}

white cement and grey cement {1-0}

who initiates the IS exchange tie? {1-0}

Wood package {1-0}

Working with the best waste managers {1-0}

Memos

=====

ME - 13/05/09 {0-Co-F} - Super

Aspects that have influenced the emergence of the clustering activities in Sagunto: (inspired by reading Chertow et al., 2008: Industrial Symbiosis in Puerto Rico)

Sagunto can be considered as a cluster that has evolved from a single sector cluster, centred on the transformation of metal, to a more complex and multi-industry cluster, after a profound restructuration process that took part in the 1980's, favoured by active policies and incentives for location.

a) Agglomeration economies: main sources (Krugman, 1991; Porter (1990, 1998))

In the case of Sagunto, the main sources of economies of agglomeration came from different sources

a.1 The presence of a well developed industrial sector and auxiliary activities and services, including skilled and abundant labour force

a.2 The availability of input sharing in the case of the metal-mechanic and cement transformation sectors

a.3 Learning opportunities and exchange of tacit knowledge, related to the innovation process

a.4 A facilitating institutional system

a.5 Access to key infrastructural goods such as the proximity to the harbour, rail and road transport networks (Duranton and Puga, 2003; Munkala, 2004; Parr, 2002)

When approaching the understanding of economies of agglomeration it may be useful to differentiate between static economies, associated with physical and infrastructural conditions, and dynamic economies, associated with the learning process and the structures of social interaction and coordination.

Chertow et al. (2008) explore the application of the cluster theory to the field of industrial symbiosis, focusing on widening the concept of agglomeration economies to include environmental benefits generated by industrial symbiosis.

Network Views

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Challenges for the development of IS network (50)

Decision-making (26)

Opportunities for the development of IS network (49)

Code-Links

=====

CHALLENGES <is associated with> ECONOMIC BARRIERS

CHALLENGES <is associated with> IS exchange didn't work

CHALLENGES <is associated with> No collaboration with neighbouring compa..

CHALLENGES <is associated with> No communication with external agents

CHALLENGES <is associated with> Regulatory barriers to waste exchange

CHALLENGES <is associated with> Some environmental investments won't pay..

CHALLENGES <is associated with> Transport costs

Climate Change Commitment: CO2 Emissions .. <contradicts> Easy to control atmospheric emissions wi..

Collaboration with companies that former.. <is associated with> No collaboration with neighbouring compa..

Communication with regulatory bodies/ag.. <is associated with> Environmental permit approval follow ver..

Competence regulation and communication .. <is associated with> Communication policy prohibits informati..

Competence regulation and communication .. <is associated with> Confidentiality policy

Confidentiality policy <is part of> Communication policy prohibits informati..

Confidentiality policy <is part of> Trust based on secrecy and confidentiality..

Conflict with municipal authorities <is associated with> Lack of technical capability of municipa..

Conflict with municipal authorities <is associated with> Regulatory bodies do not have qualified ..

Control of CO2 emissions and Emissions R.. <is associated with> Advantages of valorisation of fuels Vs i..

Control of CO2 emissions and Emissions R.. <is part of> Alternative fuels

Control of CO2 emissions and Emissions R.. <is part of> Alternative liquid fuels

Control of CO2 emissions and Emissions R.. <is part of> Alternative raw materials

Costs and benefits of environmental mana.. <is part of> Economic benefits/savings of better envi..

CSR and environmental investments <is part of> CSR and license to operate

Difficulty to find suitable waste stream.. <is part of> TECHNICAL BARRIERS

Economic benefits/savings of better envi.. <is associated with> Some benefits are generated from the reu..

Economic benefits/savings of better envi.. <is associated with> Tax reduction for environmental investme..

Economic benefits/savings of better envi.. <is associated with> The process of approval of environmental..

Environmental decision making <is associated with> Defining environmental objectives

Environmental decision making <is associated with> EMS and environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all en..

Environmental decision making <is cause of> Environmental regulations and competitiv..

Environmental permit approval follow ver.. <is part of> Administrative process is long and compl..

Environmental regulation in Europe may c.. <is associated with> Environmental regulations and competitiv..

Environmental regulation in Europe may c.. <is associated with> Implications of the enforcement of the l..

Future environmental actions/investments.. <is associated with> It is difficult to define new objectives..

Future environmental actions/investments.. <is associated with> REACH

Future environmental actions/investments.. <is associated with> RoHs

Future regulations <is associated with> Environmental regulation in Europe may c..

Future regulations <is associated with> Future environmental actions/investments..

Having the ISO 14,001 does not guarantee.. <is part of> ECONOMIC BARRIERS

Having the ISO 14,001 does not guarantee.. <is part of> External drivers: clients don't require ..

Identification of potential IS exchange .. <is associated with> Advantages of valorisation of fuels Vs i..

Identification of potential IS exchange .. <is associated with> Exploration of potential IS exchanges

Integration in the community <is associated with> OPPORTUNITIES

Internal environmental objectives go far.. <is cause of> Future regulations

Introduction of environmental principle .. <is associated with> CSR and environmental investments

Investments' approval procedure <is associated with> Introduction of environmental principle ..

IS exchange didn't work <is associated with> Difficulty to find suitable waste stream..

IS exchange didn't work <is associated with> IS exchange: minimum volume

IS exchange didn't work <is associated with> IS obstacle: sludge does not comply with..

IS exchange: minimum volume <is part of> TECHNICAL BARRIERS

IS obstacle: sludge does not comply with.. <is part of> TECHNICAL BARRIERS

It is assumed that neighbouring companie.. <is associated with> Competence regulation and communication ..

Leading environmental positioning <is associated with> Future environmental actions/investments..

Leading environmental positioning <is associated with> The direction of the group set as a prio..

Main environmental investments <is associated with> Environmental investments are generally ..

Main environmental investments <is associated with> Tax reduction for environmental investme..

Main environmental investments <is part of> Operative decisions are taken by the pla..

Management of waste streams <is associated with> Maximizing recycling rates

Management of waste streams <is associated with> Some benefits are generated from the reu..

Mutual control and communication with ne.. <is part of> Some occasional informal contacts with n..

No collaboration with neighbouring compa.. <is associated with> No communication at all with neighbourin..

No collaboration within the group <is associated with> No collaboration with neighbouring compa..

No communication with external agents <is associated with> No communication at all with neighbourin..

No communication with external agents <is associated with> Some occasional informal contacts with n..

Operative decisions are taken by the pla.. <is associated with> There is a budget for environmental impr..

OPPORTUNITIES <is associated with> Changes in production induced by changes..

OPPORTUNITIES <is associated with> Collaboration with companies that former..

OPPORTUNITIES <is associated with> Management of waste streams

OPPORTUNITIES <is associated with> Proactive attitude to comply with all en..

OPPORTUNITIES <is associated with> Relevance of environmental principles in..

OPPORTUNITIES <is associated with> Some occasional informal contacts with n..

Pollution control technologies won't pay.. <is associated with> Environmental investments

Pollution control technologies won't pay.. <is associated with> There is no restriction to environmental..

Proactive attitude to comply with all en.. <is associated with> Future environmental actions/investments..

Proactive attitude to comply with all en.. <is associated with> Main environmental investments

Proactive attitude to comply with all en.. <is associated with> There is no restriction to environmental..

Proactive attitude to comply with all en.. <is cause of> Internal environmental objectives go far..

Proposal of improvements <is associated with> Introduction of environmental principle ..

Reduction of CO2 emissions by substituti.. <is part of> Identification of potential IS exchange ..

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

Regulatory bodies do not have qualified .. <is associated with> Lack of technical capability of municipa..

Relevance of environmental principles in.. <is associated with> BATs

Relevance of environmental principles in.. <is associated with> Need to go beyond current EMS towards th..

Some benefits are generated from the reu.. <is associated with> Reduction of CO2 emissions by substituti..

Some environmental investments won't pay.. <is associated with> Having the ISO 14,001 does not guarantee..

Some environmental investments won't pay.. <is associated with> Payback time for environmental investmen..

Some environmental investments won't pay.. <is part of> ECONOMIC BARRIERS

Some occasional informal contacts with n.. <is associated with> Collaboration with companies that former..

Some occasional informal contacts with n.. <is associated with> Collaboration with other plants to discu..

The direction of the group set as a prio.. <is associated with> CSR and environmental investments

The direction of the group set as a prio.. <is associated with> CSR and license to operate

The direction of the group set as a prio.. <is associated with> Environmental decision making

The direction of the group set as a prio.. <is associated with> Main environmental investments

The direction of the group set as a prio.. <is associated with> Proactive attitude to comply with all en..

The process of approval of environmental.. <is associated with> Costs and benefits of environmental mana..

The process of approval of environmental.. <is associated with> Main environmental investments

The process of approval of environmental.. <is part of> Investments' approval procedure

There is no restriction to environmental.. <is associated with> Payback time for environmental investmen..

There is no restriction to environmental.. <is associated with> Some environmental investments won't pay..

There is no restriction to environmental.. <is cause of> Environmental investments are generally ..

Transport costs <is associated with> Transport of waste streams

Waste regulation and IS exchanges <is associated with> A regional regulation classify scrap as ..

Waste regulation and IS exchanges <is associated with> Attempt to valorise used maintenance oil..

Waste regulation and IS exchanges <is associated with> Climate Change Commitment: CO2 Emissions ..

Waste regulation and IS exchanges <is associated with> Conflict with municipal authorities

Waste regulation and IS exchanges <is associated with> Easy to control atmospheric emissions wi..

Waste regulation and IS exchanges <is associated with> IS exchange: sludge to cement company

Waste regulation and IS exchanges <is associated with> No regular communication with regulatory..

Waste regulation and IS exchanges <is associated with> Regulation is preventing wood recycling

Waste regulation and IS exchanges <is associated with> Sludge cannot be used as by-product due ..

Waste regulation and IS exchanges <is associated with> Waste managers and responsibility

Waste regulation and IS exchanges <is associated with> Waste regulation has prevented possible ..

2. List of codes

Code-Filter: All

HU: SAGUNTO1
File: [R:\PHD\SAGUNTO1.hpr5]
Edited by: Super
Date/Time: 10/05/2010 17:13:35

A regional regulation classify scrap as by-product
Absence of regular inspections by regulatory bodies
Acid regeneration was considered but finally rejected for the costt of the investment
Administrative process is long and complex
Advantages of valorisation of fuels Vs inceneration
Alternative fuels
Alternative liquid fuels
Alternative raw materials
Another company runs the waster treatment plant and by-products generated
Approval of environmental objectives
Approval of new inputs: environmental requirements
Assignment of roles
ATmospheric emission control technologies: filters
Atmospheric emission reduction
Atmospheric emissions
Atmospheric emissions and recovery of acid
Atmospheric emissions control technologies
ATmospheric emissions: oily mist from tandem
Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers
BAT adopted throughout the process
BATs
better control of environmental aspects
biomass
Bottom-up approach: environmental improvements
By-product clinker
By-product lamination: full hard
By-product: Clinker
By-product: Full hard
By-product: iron oxide
By-products and recycled waste streams
By-products: full-hard
By-products: sludge with high content in iron to be used in agriculture
By product: Scrap (to be melt in blast furnaces)
Cement grinding and IPPC
Certifications
CHALLENGES
Changes in production induced by changes in environmental regulations

Climate Change Commitment: CO2 Emissions cap
co-generation was not feasible option but recovery of heat
Cogeneration
Cold laminated coils warehouse
Cold rolled steel coils
Collaboration with companies that formerly belonged to the same group
Collaboration with other plants to discuss regulatory issues
Collaboration within the group
Combination of internal and external drivers
Communication policy prohibits information exchange with external agents
Communication with regulatory bodies/agents
Communication with admin is generally mediated by an external consultancy firm
Competence regulation and communication policy of the company does not allow exchange of information with third actors
Conditioning of waste to be used as alternative fuel
Confidentiality policy
Conflict with municipal authorities
Connexion to other nodes: metal2
Continuous improvement
Continuous process
Control of CO2 emissions and Emissions Reduction Commitment
Cooperation is not based on frequent communication
Costs and benefits of environmental management
CSR and environmental investments
CSR and license to operate
Decisions concerning regulatory permits/ requirements are taken by the group
Defining environmental objectives
Destiny of galvanised products: car industry
Differences between electrozincate and hot dip galvanising
Different providers of main raw materials
Difficulty to find suitable waste streams in high volumes
Diffused emissions are more difficult to control
Documentation and compliance with regulatory requirements
Drivers for adoption EMS
Each plant within the group has the responsibility to keep up to date with all requirements
Easy to control atmospheric emissions within limits set by regulations
ECONOMIC BARRIERS
Economic benefits/savings of better environmental management
Economic cost of using sea water for production is too high
Elimination of chromium VI
EMS and environmental investments
EMS documentation
EMS process
EMS: advantages
Environmental committee has periodical meetings
Environmental communication and training
Environmental decision making
Environmental impacts of etching
Environmental impacts: electrozincate
Environmental investments

Environmental investments and licence to operate
 Environmental investments are generally approved while production investments have to compete with other plants
 Environmental management as a cost for the company
 Environmental objectives
 Environmental permit approval follow very long administrative processes
 Environmental programme and internal revision of the system
 Environmental ranking of plants
 Environmental regulation in Europe may compromise profitability of industrial companies
 Environmental regulations and competitive position
Etching
 etching steel coils warehouse
Examination and analytical procedures of alternative raw materials
 Examination of new raw materials
 Exploration of potential IS exchanges
 External driver: community
 External drivers: car industry
 External drivers: clients don't require ISO 14,001
 Factory open days
 Final product: cold laminated steel
 fly ash for grinding
 Future environmental actions/investments
 Future regulations
 good communication
 Groundwater wells
 Having the ISO 14,001 does not guarantee that your clients are going to buy you
 Hot dip galvanising
 Identification of potential IS exchange ties: Alternative raw materials
 Implications of the enforcement of the IPPC
 Importance of alternative fuels %
 Improvements generated as a consequence of the EMS
Inspections
Integral Environmental Autorisation
 Integration of systems
 Integration in the community
 Integration of environmental and worker security policies
 intermediary warehouse to regulate the process
 Internal audit
 Internal driver
 Internal environmental objectives go far beyond environmental regulation
 Introduction of environmental principle in investment's approval procedure
 Investments' approval procedure
 IPPC regulation: revision of the regulation including cement grinding companies
 IS by-product: Zinc pot
 IS exchange didn't work
 IS exchange: minimum volume
 IS exchange: old blast furnace
 IS exchange: sludge to cement company
 IS flow: shared use of waste treatment plant
 IS obstacle: sludge does not comply with chemical requirements defined by the cement factory

IS opportunities with neighbouring companies
IS opportunities: economic benefits
IS opportunities: infrastructures sharing
IS: Maintenance oils are valorised by an external waste manager
IS: recovery of solvents
ISO 14,001
ISO 14,001 certification
It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation
It is difficult to define new objectives and target after a few years
Lack of technical capability of municipal authorities
Leading environmental positioning
Low priority of environmental issues
Main activity of the company
Main alternative raw materials: ceramics, fly ash
Main clients: car industry, domestic appliances and constructions
Main environmental impacts: lamination and re-cooking
Main environmental investments
Main fuels
Main production process: Lamination
Main raw materials come from companies in the area
main waste streams
Management of alternative liquid fuels
Management of waste streams
Material balances
Maximizing recycling rates
Mutual control and communication with neighbouring companies
Need to go beyond current EMS towards the integration of eco-efficiency
Negotiation of prices for alternative fuels
Negotiation of prices of alternative raw materials
No collaboration with neighbouring companies
No collaboration within the group
No communication at all with neighbouring companies
No communication with external agents
No regular communication with regulatory bodies
Only information exchange no material exchange
Operative decisions are taken by the plant
OPPORTUNITIES
Opportunities to introduce new waste streams into the production process
Organisation and assignation of environmental roles: cooperation within the group
Origin of raw materials
Other low volume waste streams
Paper and cardboard: external recyclers
Payback time for environmental investments
Periodical meetings of environmental committee
Plant cross comparisons and case studies
Plant was already certified before it was a requirement of clients
Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption
Possible use of sludge in cement companies

Proactive attitude to comply with all environmental requirements
Production phase: clinker grinding
Production phase: cooling
Production phase: electrozincate
Production phase: grinding
Production phase: homegenization of raw metrials
Production phase: oven cooking
Production phase: selection of raw materials
Production process: phases
Production process: re-cooking
Production process: surface tempering
Proposal of improvements
Re-cooked coil warehouse
REACH
recovery of acid from fume cleaning system
Reduction of CO2 emissions by substitution of fuels using biomass
Reduction of total emissions
Regeneration of acid within the plant
Regenerative thermal oxidation for the control of VOC's
Regulation is preventing wood recycling
Regulatory barriers to waste exchange
Regulatory bodies do not have qualified personnel for the enforcement of IPPC
Relationship with regulatory bodies
relevance given to Environmental management
Relevance of alternative raw materials %
Relevance of environmental principles in the strategy of the company
Reluctancy to collaborate with neighbouring companies
Reluctancy to provide information in futere investments or future regulations
Restrictive communication policy hinder any attempt to collaborate with neighbouring companies
Reuse of treated waste water for dissolution of lime
RoHs
Role of the group environmental coordinator
Security
Self control and monitoring of emissions and effluents
Several types of cement products
sludge
Sludge cannot be used as by-product due to its classification as a waste
Sludge: non hazardous
Some benefits are generated from the reuse and recycle of waste streams
Some environmental investments won't payback
Some informal communication with neighbouring companies
Some occasional informal contacts with neighbouring plants in environmental issues
Substitution of chromium VI and Nickel
Substitution of raw materials for waste streams reduced cost of production
Successful achievement of environmental objectives
Tax reduction for environmental investments
TECHNICAL BARRIERS
The direction of the group set as a priority to be up to date with all environmental requirements

The process of approval of environmental investments
There is a budget for environmental improvements
There is no restriction to environmental investments required by regulation
Transport costs
Transport of raw materials and final products
Transport of waste streams
Trust based on secrecy and confidentiality
Types of waste streams
Use of oil emulsion in lamination
Use of waste streams is limited by valorisation installations and waste market
Use of water: cooling of gases and refrigeration
Valorisation installations: requirements
Valorisation of waste and IS exchanges payback
Warehouse warm rolled coil
Waste management
waste manager and waste producer
Waste managers and responsibility
Waste regulation and IS exchanges
Waste regulation has prevented possible by-product exchanges
Waste stream: exhausted acid
Waste treatment plant
waste treatment plant process
Waste use and types of water quality
waste valorisation in cement companies
We are prepared for the future
white cement and grey cement
who initiates the IS exchange tie?
Wood package
Working with the best waste managers

3. Code Neighbours

HU: SAGUNTO1

File: [R:\PHD\SAGUNTO1.hpr5]

Edited by: Super

Date/Time: 10/05/2010 17:14:19

Code neighbors list

Code-Filter: All [260]

A regional regulation classify scrap as by-product

Waste regulation and IS exchanges <is associated with>

Absence of regular inspections by regulatory bodies

Acid regeneration was considered but finally rejected for the costt of the investment

Administrative process is long and complex

Environmental permit approval follow very long administrative processes <is part of>

Advantages of valorisation of fuels Vs inceneration

Control of CO2 emissions and Emissions Reduction Commitment <is associated with>

Identification of potential IS exchange ties: Alternative raw materials <is associated with>

Alternative fuels

Control of CO2 emissions and Emissions Reduction Commitment <is part of>

Alternative liquid fuels

Control of CO2 emissions and Emissions Reduction Commitment <is part of>

Alternative raw materials

Control of CO2 emissions and Emissions Reduction Commitment <is part of>

Another company runs the waster treatment plant and by-products generated

Approval of environmental objectives

Approval of new inputs: environmental requirements

Assignment of roles

ATmospheric emission control technologies: filters

Atmospheric emission reduction

Atmospheric emissions

Atmospheric emissions and recovery of acid

Atmospheric emissions control technologies

ATmospheric emissions: oily mist from tandem

Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers

Waste regulation and IS exchanges <is associated with>

BAT adopted throughout the process

BATs

Relevance of environmental principles in the strategy of the company <is associated with>

better control of environmental aspects

biomass

Bottom-up approach: environmental improvements

By-product clinker

By-product lamination: full hard

By-product: Clinker

By-product: Full hard

By-product: iron oxide

By-products and recycled waste streams

By-products: full-hard

By-products: sludge with high content in iron to be used in agriculture

By product: Scrap (to be melt in blast furnaces)

Cement grinding and IPPC

Certifications

CHALLENGES

<is associated with> ECONOMIC BARRIERS

<is associated with> IS exchange didn't work

<is associated with> No collaboration with neighbouring companies

<is associated with> No communication with external agents

<is associated with> Regulatory barriers to waste exchange

<is associated with> Some environmental investments won't payback

<is associated with> Transport costs

Changes in production induced by changes in environmental regulations

OPPORTUNITIES <is associated with>

Climate Change Commitment: CO2 Emissions cap

<contradicts> Easy to control atmospheric emissions within limits set by regulations

Waste regulation and IS exchanges <is associated with>

co-generation was not feasible option but recovery of heat

Cogeneration

Cold laminated coils warehouse

Cold rolled steel coils

Collaboration with companies that formerly belonged to the same group

<is associated with> No collaboration with neighbouring companies

OPPORTUNITIES <is associated with>

Some occasional informal contacts with neighbouring plants in environmental issues <is associated with>

Collaboration with other plants to discuss regulatory issues

Some occasional informal contacts with neighbouring plants in environmental issues <is associated with>

Collaboration within the group

Combination of internal and external drivers

Communication policy prohibits information exchange with external agents

Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with>

Confidentiality policy <is part of>

Communication with regulatory bodies/agents

<is associated with> Environmental permit approval follow very long administrative processes

Communication with admin is generally mediated by an external consultancy firm

Competence regulation and communication policy of the company does not allow exchange of information with third actors

<is associated with> Communication policy prohibits information exchange with external agents

<is associated with> Confidentiality policy

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is associated with>

Conditioning of waste to be used as alternative fuel

Confidentiality policy

<is part of> Communication policy prohibits information exchange with external agents

<is part of> Trust based on secrecy and confidentiality

Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with>

Conflict with municipal authorities

<is associated with> Lack of technical capability of municipal authorities

<is associated with> Regulatory bodies do not have qualified personnel for the enforcement of IPPC

Waste regulation and IS exchanges <is associated with>

Connexion to other nodes: metal2

Continous improvement

Continuos process

Control of CO2 emissions and Emissions Reduction Commitment

<is associated with> Advantages of valorisation of fuels Vs inceneration

<is part of> Alternative fuels

<is part of> Alternative liquid fuels

<is part of> Alternative raw materials

Cooperation is not based on frequent communication

Costs and benefits of environmental management

<is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with>

CSR and environmental investments

<is part of> CSR and license to operate

Introduction of environmental principle in investment's approval procedure <is associated with>

The direction of the group set as a priority to be up to date with all environmental requirements
<is associated with>

CSR and license to operate

CSR and environmental investments <is part of>

The direction of the group set as a priority to be up to date with all environmental requirements
<is associated with>

Decisions concerning regulatory permits/ requirements are taken by the group

Defining environmental objectives

Environmental decision making <is associated with>

Destiny of galvanised products: car industry

Differences between electrozincate and hot dip galvanising

Different providers of main raw materials

Difficulty to find suitable waste streams in high volumes

<is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with>

Difused emissions are more difficult to control

Documentation and compliance with regulatory requirements

Drivers for adoption EMS

Each plant within the group has the responsibility to keep up to date with all requirements

Easy to control atmospheric emissions within limits set by regulations

Climate Change Commitment: CO2 Emissions cap <contradicts>

Waste regulation and IS exchanges <is associated with>

ECONOMIC BARRIERS

CHALLENGES <is associated with>

Having the ISO 14,001 does not guarantee that your clients are going to buy you <is part of>

Some environmental investments won't payback <is part of>

Economic benefits/savings of better environmental management

<is associated with> Some benefits are generated from the reuse and recycle of waste streams

<is associated with> Tax reduction for environmental investments

<is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of>

Economic cost of using sea water for production is to high

Elimination of chromium VI

EMS and environmental investments

Environmental decision making <is associated with>

EMS documentation

EMS process

EMS: advantages

Environmental committee has periodical meetings

Environmental communication and training

Environmental decision making

<is associated with> Defining environmental objectives

<is associated with> EMS and environmental investments

<is cause of> Environmental regulations and competitive position

<is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements
<is associated with>

Environmental impacts of etching

Environmental impacts: electrozincate

Environmental investments

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with>

Environmental investments and licence to operate

Environmental investments are generally approved while production investments have to compete with other plants

Main environmental investments <is associated with>

There is no restriction to environmental investments required by regulation <is cause of>

Environmental management as a cost for the company

Environmental objectives

Environmental permit approval follow very long administrative processes

<is part of> Administrative process is long and complex

Communication with regulatory bodies/agents <is associated with>

Environmental programme and internal revision of the system

Environmental ranking of plants

Environmental regulation in Europe may compromise profitability of industrial companies

<is associated with> Environmental regulations and competitive position

<is associated with> Implications of the enforcement of the IPPC

Future regulations <is associated with>

Environmental regulations and competitive position

Environmental decision making <is cause of>

Environmental regulation in Europe may compromise profitability of industrial companies <is associated with>

Etching

etching steel coils warehouse

Examination and analytical procedures of alternative raw materials

Examination of new raw materials

Exploration of potential IS exchanges

Identification of potential IS exchange ties: Alternative raw materials <is associated with>

External driver: community

External drivers: car industry

External drivers: clients don't require ISO 14,001

Having the ISO 14,001 does not guarantee that your clients are going to buy you <is part of>

Factory open days

Final product: cold laminated steel

fly ash for grinding

Future environmental actions/investments

<is associated with> It is difficult to define new objectives and target after a few years

<is associated with> REACH

<is associated with> RoHs

Future regulations <is associated with>

Leading environmental positioning <is associated with>

Proactive attitude to comply with all environmental requirements <is associated with>

Future regulations

<is associated with> Environmental regulation in Europe may compromise profitability of industrial companies

<is associated with> Future environmental actions/investments

Internal environmental objectives go far beyond environmental regulation <is cause of>

good communication

Groundwater wells

Having the ISO 14,001 does not guarantee that your clients are going to buy you

<is part of> ECONOMIC BARRIERS

<is part of> External drivers: clients don't require ISO 14,001

Some environmental investments won't payback <is associated with>

Hot dip galvanising

Identification of potential IS exchange ties: Alternative raw materials

<is associated with> Advantages of valorisation of fuels Vs inceneration

<is associated with> Exploration of potential IS exchanges

Reduction of CO2 emissions by substitution of fuels using biomass <is part of>

Implications of the enforcement of the IPPC

Environmental regulation in Europe may compromise profitability of industrial companies <is associated with>

Importance of alternative fuels %

Improvements generated as a consequence of the EMS

Inspections

Integral Environmental Autorisation

Integration f systems

Integration in the community

<is associated with> OPPORTUNITIES

Integration of environmental and worker security policies

intermediary warehouse to regulate the process

Internal audit

Internal driver

Internal environmental objectives go far beyond environmental regulation

<is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of>

Introduction of environmental principle in investment's approval procedure

<is associated with> CSR and environmental investments

Investments' approval procedure <is associated with>

Proposal of improvements <is associated with>

Investments' approval procedure

<is associated with> Introduction of environmental principle in investment's approval procedure

The process of approval of environmental investments <is part of>

IPPC regulation: revision of the regulation including cement grinding companies

IS by-product: Zinc pot

IS exchange didn't work

<is associated with> Difficulty to find suitable waste streams in high volumes

<is associated with> IS exchange: minimum volume

<is associated with> IS obstacle: sludge does not comply with chemical requirements defined by the cement factory

CHALLENGES <is associated with>

IS exchange: minimum volume

<is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with>

IS exchange: old blast furnace

IS exchange: sludge to cement company

Waste regulation and IS exchanges <is associated with>

IS flow: shared use of waste treatment plant

IS obstacle: sludge does not comply with chemical requirements defined by the cement factory

<is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with>

IS opportunities with neighbouring companies

IS opportunities: economic benefits

IS opportunities: infrastructures sharing

IS: Maintenance oils are valorised by an external waste manager

IS: recovery of solvents

ISO 14,001

ISO 14,001 certification

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation

<is associated with> Competence regulation and communication policy of the company does not allow exchange of information with third actors

It is difficult to define new objectives and target after a few years

Future environmental actions/investments <is associated with>

Lack of technical capability of municipal authorities

Conflict with municipal authorities <is associated with>

Regulatory bodies do not have qualified personnel for the enforcement of IPPC <is associated with>

Leading environmental positioning

<is associated with> Future environmental actions/investments

<is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

Low priority of environmental issues

Main activity of the company

Main alternative raw materials: ceramics, fly ash

Main clients: car industry, domestic appliances and constructions

Main environmental impacts: lamination and re-cooking

Main environmental investments

<is associated with> Environmental investments are generally approved while production investments have to compete with other plants

<is part of> Operative decisions are taken by the plant

<is associated with> Tax reduction for environmental investments

Proactive attitude to comply with all environmental requirements <is associated with>

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with>

The process of approval of environmental investments <is associated with>

Main fuels

Main production process: Lamination

Main raw materials come from companies in the area

main waste streams

Management of alternative liquid fuels

Management of waste streams

<is associated with> Maximizing recycling rates

<is associated with> Some benefits are generated from the reuse and recycle of waste streams

OPPORTUNITIES <is associated with>

Material balances

Maximizing recycling rates

Management of waste streams <is associated with>

Mutual control and communication with neighbouring companies

<is part of> Some occasional informal contacts with neighbouring plants in environmental issues

Need to go beyond current EMS towards the integration of eco-efficiency

Relevance of environmental principles in the strategy of the company <is associated with>

Negotiation of prices for alternative fuels

Negotiation of prices of alternative raw materials

No collaboration with neighbouring companies

<is associated with> No communication at all with neighbouring companies

CHALLENGES <is associated with>

Collaboration with companies that formerly belonged to the same group <is associated with>

No collaboration within the group <is associated with>

No collaboration within the group

<is associated with> No collaboration with neighbouring companies

No communication at all with neighbouring companies

No collaboration with neighbouring companies <is associated with>

No communication with external agents <is associated with>

No communication with external agents

<is associated with> No communication at all with neighbouring companies

<is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

CHALLENGES <is associated with>

No regular communication with regulatory bodies

Waste regulation and IS exchanges <is associated with>

Only information exchange no material exchange

Operative decisions are taken by the plant

<is associated with> There is a budget for environmental improvements

Main environmental investments <is part of>

OPPORTUNITIES

<is associated with> Changes in production induced by changes in environmental regulations

<is associated with> Collaboration with companies that formerly belonged to the same group

<is associated with> Management of waste streams

<is associated with> Proactive attitude to comply with all environmental requirements

<is associated with> Relevance of environmental principles in the strategy of the company

<is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

Integration in the community <is associated with>

Opportunities to introduce new waste streams into the production process

Organisation and assignation of environmental roles: cooperation within the group

Origin of raw materials

Other low volume waste streams

Paper and cardboard: external recyclers

Payback time for environmental investments

Some environmental investments won't payback <is associated with>

There is no restriction to environmental investments required by regulation <is associated with>

Periodical meetings of environmental committee

Plant cross comparissons and case studies

Plant was already certified before it was a requirement of clients

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption

<is associated with> Environmental investments

<is associated with> There is no restriction to environmental investments required by regulation

Possible use of sludge in cement companies

Proactive attitude to comply with all environmental requirements

<is associated with> Future environmental actions/investments

<is cause of> Internal environmental objectives go far beyond environmental regulation

<is associated with> Main environmental investments

<is associated with> There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with>

OPPORTUNITIES <is associated with>

The direction of the group set as a priority to be up to date with all environmental requirements
<is associated with>

Production phase: clinker grinding

Production phase: cooling

Production phase: electrozincate

Production phase: grinding

Production phase: homegenization of raw metrials

Production phase: oven cooking

Production phase: selection of raw materials

Production process: phases

Production process: re-cooking

Production process: surface tempering

Proposal of improvements

<is associated with> Introduction of environmental principle in investment's approval procedure

Re-cooked coil warehouse

REACH

Future environmental actions/investments <is associated with>

recovery of acid from fume cleaning system

Reduction of CO2 emissions by substitution of fuels using biomass

<is part of> Identification of potential IS exchange ties: Alternative raw materials

Some benefits are generated from the reuse and recycle of waste streams <is associated with>

Reduction of total emissions

Regeneration of acid within the plant

Regenerative thermal oxidation for the control of VOC's

Regulation is preventing wood recycling

Waste regulation and IS exchanges <is associated with>

Regulatory barriers to waste exchange

<is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with>

Regulatory bodies do not have qualified personnel for the enforcement of IPPC

<is associated with> Lack of technical capability of municipal authorities

Conflict with municipal authorities <is associated with>

Relationship with regulatory bodies

relevance given to Environmental management

Relevance of alternative raw materials %

Relevance of environmental principles in the strategy of the company

<is associated with> BATs

<is associated with> Need to go beyond current EMS towards the integration of eco-efficiency

OPPORTUNITIES <is associated with>

Reluctancy to collaborate with neighbouring companies

Reluctancy to provide information in future investments or future regulations

Restrictive communication policy hinder any attempt to collaborate with neighbouring companies

Reuse of treated waste water for dissolution of lime

RoHs

Future environmental actions/investments <is associated with>

Role of the group environmental coordinator

Security

Self control and monitoring of emissions and effluents

Several types of cement products

sludge

Sludge cannot be used as by-product due to its classification as a waste

Waste regulation and IS exchanges <is associated with>

Sludge: non hazardous

Some benefits are generated from the reuse and recycle of waste streams

<is associated with> Reduction of CO2 emissions by substitution of fuels using biomass

Economic benefits/savings of better environmental management <is associated with>

Management of waste streams <is associated with>

Some environmental investments won't payback

<is part of> ECONOMIC BARRIERS

<is associated with> Having the ISO 14,001 does not guarantee that your clients are going to buy you

<is associated with> Payback time for environmental investments

CHALLENGES <is associated with>

There is no restriction to environmental investments required by regulation <is associated with>

Some informal communication with neighbouring companies

Some occasional informal contacts with neighbouring plants in environmental issues

<is associated with> Collaboration with companies that formerly belonged to the same group

<is associated with> Collaboration with other plants to discuss regulatory issues

Mutual control and communication with neighbouring companies <is part of>

No communication with external agents <is associated with>

OPPORTUNITIES <is associated with>

Substitution of chromium VI and Nickel

Substitution of raw materials for waste streams reduced cost of production

Successful achievement of environmental objectives

Tax reduction for environmental investments

Economic benefits/savings of better environmental management <is associated with>

Main environmental investments <is associated with>

TECHNICAL BARRIERS

Difficulty to find suitable waste streams in high volumes <is part of>

IS exchange: minimum volume <is part of>

IS obstacle: sludge does not comply with chemical requirements defined by the cement factory <is part of>

The direction of the group set as a priority to be up to date with all environmental requirements

<is associated with> CSR and environmental investments

<is associated with> CSR and license to operate

<is associated with> Environmental decision making

<is associated with> Main environmental investments

<is associated with> Proactive attitude to comply with all environmental requirements

Leading environmental positioning <is associated with>

The process of approval of environmental investments

<is associated with> Costs and benefits of environmental management

<is part of> Investments' approval procedure

<is associated with> Main environmental investments

Economic benefits/savings of better environmental management <is associated with>

There is a budget for environmental improvements

Operative decisions are taken by the plant <is associated with>

There is no restriction to environmental investments required by regulation

<is cause of> Environmental investments are generally approved while production investments have to compete with other plants

<is associated with> Payback time for environmental investments

<is associated with> Some environmental investments won't payback

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with>

Proactive attitude to comply with all environmental requirements <is associated with>

Transport costs

<is associated with> Transport of waste streams

CHALLENGES <is associated with>

Transport of raw materials and final products

Transport of waste streams

Transport costs <is associated with>

Trust based on secrecy and confidentiality

Confidentiality policy <is part of>

Types of waste streams

Use of oil emulsion in lamination

Use of waste streams is limited by valorisation installations and waste market

Use of water: cooling of gases and refrigeration

Valorisation installations: requirements

Valorisation of waste and IS exchanges payback

Warehouse warm rolled coil

Waste management

waste manager and waste producer

Waste managers and responsibility

Waste regulation and IS exchanges <is associated with>

Waste regulation and IS exchanges

<is associated with> A regional regulation classify scrap as by-product

<is associated with> Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers

<is associated with> Climate Change Commitment: CO2 Emissions cap

<is associated with> Conflict with municipal authorities

<is associated with> Easy to control atmospheric emissions within limits set by regulations

<is associated with> IS exchange: sludge to cement company

<is associated with> No regular communication with regulatory bodies

<is associated with> Regulation is preventing wood recycling

<is associated with> Sludge cannot be used as by-product due to its classification as a waste

<is associated with> Waste managers and responsibility

<is associated with> Waste regulation has prevented possible by-product exchanges

Regulatory barriers to waste exchange <is associated with>

Waste regulation has prevented possible by-product exchanges

Waste regulation and IS exchanges <is associated with>

Waste stream: exhausted acid

Waste treatment plant

waste treatment plant process

Waste use and types of water quality

waste valorisation in cement companies

We are prepared for the future

white cement and grey cement

who initiates the IS exchange tie?

Wood package

Working with the best waste managers

4. Code Hierarchy

Codes hierarchy

Code-Filter: All

HU: SAGUNTO1
File: [R:\PHD\SAGUNTO1.hpr5]
Edited by: Super
Date/Time: 29/06/2010 23:31:12

A regional regulation classify scrap as by-product <is> Root
Waste regulation and IS exchanges <is associated with> A regional regulation classify scrap as by-product
Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges
CHALLENGES <is associated with> Regulatory barriers to waste exchange

Absence of regular inspections by regulatory bodies <is> Root

Acid regeneration was considered but finally rejected for the costt of the investment <is> Root

Administrative process is long and complex <is> Root
Environmental permit approval follow very long administrative processes <is part of>
Administrative process is long and complex
Communication wirth regulatory bodies/agents <is associated with> Environmental permit approval follow very long administrative processes

Advantages of valorisation of fuels Vs inceneration <is> Root
Control of CO2 emissions and Emissions Reduction Commitment <is associated with>
Advantages of valorisation of fuels Vs inceneration
Identification of potential IS exchange ties: Alternative raw materials <is associated with>
Advantages of valorisation of fuels Vs inceneration
Reduction of CO2 emissions by substitution of fuels using biomass <is part of>
Identification of potential IS exchange ties: Alternative raw materials
Some benefits are generated from the reuse and recycle of waste streams <is associated with> Reduction of CO2 emissions by substitution of fuels using biomass
Economic benefits/savings of better environmental management <is associated with> Some benefits are generated from the reuse and recycle of waste streams
Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
Management of waste streams <is associated with> Some benefits are generated from the reuse and recycle of waste streams
OPPORTUNITIES <is associated with> Management of waste streams

Integration in the community <is associated with> OPPORTUNITIES

Alternative fuels <is> Root

Control of CO2 emissions and Emissions Reduction Commitment <is part of> Alternative fuels

Alternative liquid fuels <is> Root

Control of CO2 emissions and Emissions Reduction Commitment <is part of> Alternative liquid fuels

Alternative raw materials <is> Root

Control of CO2 emissions and Emissions Reduction Commitment <is part of> Alternative raw materials

Another company runs the waster treatment plant and by-products generated <is> Root

Approval of environmental objectives <is> Root

Approval of new inputs: environmental requirements <is> Root

Assignment of roles <is> Root

ATmospheric emission control technologies: filters <is> Root

Atmospheric emission reduction <is> Root

Atmospheric emissions <is> Root

Atmospheric emissions and recovery of acid <is> Root

Atmospheric emissions control technologies <is> Root

ATmospheric emissions: oily mist from tandem <is> Root

Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers <is> Root

Waste regulation and IS exchanges <is associated with> Attempt to valorise used maintenance oil as fuel but not too many regulatory barriers

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

BAT adopted throughout the process <is> Root

BATs <is> Root

Relevance of environmental principles in the strategy of the company <is associated with>

BATs

OPPORTUNITIES <is associated with> Relevance of environmental principles in the strategy of the company

Integration in the community <is associated with> OPPORTUNITIES

better control of environmental aspects <is> Root

biomass <is> Root

Bottom-up approach: environmental improvements <is> Root

By-product clinker <is> Root

By-product lamination: full hard <is> Root

By-product: Clinker <is> Root

By-product: Full hard <is> Root

By-product: iron oxide <is> Root

By-products and recycled waste streams <is> Root

By-products: full-hard <is> Root

By-products: sludge with high content in iron to be used in agriculture <is> Root

By product: Scrap (to be melt in blast furnaces) <is> Root

Cement grinding and IPPC <is> Root

Certifications <is> Root

CHALLENGES <is> Root

Changes in production induced by changes in environmental regulations <is> Root

 OPPORTUNITIES <is associated with> Changes in production induced by changes in environmental regulations

 Integration in the community <is associated with> OPPORTUNITIES

Climate Change Commitment: CO2 Emissions cap <is> Root

 Waste regulation and IS exchanges <is associated with> Climate Change Commitment: CO2 Emissions cap

 Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

 CHALLENGES <is associated with> Regulatory barriers to waste exchange

co-generation was not feasible option but recovery of heat <is> Root

Cogeneration <is> Root

Cold laminated coils warehouse <is> Root

Cold rolled steel coils <is> Root

Collaboration with companies that formerly belonged to the same group <is> Root

 OPPORTUNITIES <is associated with> Collaboration with companies that formerly belonged to the same group

 Integration in the community <is associated with> OPPORTUNITIES

Some occasional informal contacts with neighbouring plants in environmental issues <is associated with> Collaboration with companies that formerly belonged to the same group
Mutual control and communication with neighbouring companies <is part of> Some occasional informal contacts with neighbouring plants in environmental issues
No communication with external agents <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues
CHALLENGES <is associated with> No communication with external agents
OPPORTUNITIES <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

Collaboration with other plants to discuss regulatory issues <is> Root
Some occasional informal contacts with neighbouring plants in environmental issues <is associated with> Collaboration with other plants to discuss regulatory issues
Mutual control and communication with neighbouring companies <is part of> Some occasional informal contacts with neighbouring plants in environmental issues
No communication with external agents <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues
CHALLENGES <is associated with> No communication with external agents
OPPORTUNITIES <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues
Integration in the community <is associated with> OPPORTUNITIES

Collaboration within the group <is> Root

Combination of internal and external drivers <is> Root

Communication policy prohibits information exchange with external agents <is> Root
Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with> Communication policy prohibits information exchange with external agents
It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is associated with> Competence regulation and communication policy of the company does not allow exchange of information with third actors
Confidentiality policy <is part of> Communication policy prohibits information exchange with external agents
Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with> Confidentiality policy

Communication with regulatory bodies/agents <is> Root

Communication with admin is generally mediated by an external consultancy firm <is> Root

Competence regulation and communication policy of the company does not allow exchange of information with third actors <is> Root
It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is associated with> Competence regulation and communication policy of the company does not allow exchange of information with third actors

Conditioning of waste to be used as alternative fuel <is> Root

Confidentiality policy <is> Root

Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with> Confidentiality policy

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is associated with> Competence regulation and communication policy of the company does not allow exchange of information with third actors

Conflict with municipal authorities <is> Root

Waste regulation and IS exchanges <is associated with> Conflict with municipal authorities

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Connexion to other nodes: metal2 <is> Root

Continous improvement <is> Root

Continuos process <is> Root

Control of CO2 emissions and Emissions Reduction Commitment <is> Root

Cooperation is not based on frequent communication <is> Root

Costs and benefits of environmental management <is> Root

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

CSR and environmental investments <is> Root

Introduction of environmental principle in investment's approval procedure <is associated with> CSR and environmental investments

Investments' approval procedure <is associated with> Introduction of environmental principle in investment's approval procedure

The process of approval of environmental investments <is part of> Investments' approval procedure

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Proposal of improvements <is associated with> Introduction of environmental principle in investment's approval procedure

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> CSR and environmental investments

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

CSR and license to operate <is> Root

CSR and environmental investments <is part of> CSR and license to operate
Introduction of environmental principle in investment's approval procedure <is associated with> CSR and environmental investments
Investments' approval procedure <is associated with> Introduction of environmental principle in investment's approval procedure
The process of approval of environmental investments <is part of> Investments' approval procedure
Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
Proposal of improvements <is associated with> Introduction of environmental principle in investment's approval procedure
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> CSR and environmental investments
Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> CSR and license to operate

Decisions concerning regulatory permits/ requirements are taken by the group <is> Root

Defining environmental objectives <is> Root

Environmental decision making <is associated with> Defining environmental objectives
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

Destiny of galvanised products: car industry <is> Root

Differences between electrozincate and hot dip galvanising <is> Root

Different providers of main raw materials <is> Root

Difficulty to find suitable waste streams in high volumes <is> Root

IS exchange didn't work <is associated with> Difficulty to find suitable waste streams in high volumes
CHALLENGES <is associated with> IS exchange didn't work

Difused emissions are more difficult to control <is> Root

Documentation and compliance with regulatory requirements <is> Root

Drivers for adoption EMS <is> Root

Each plant within the group has the responsibility to keep up to date with all requirements <is> Root

Easy to control atmospheric emissions within limits set by regulations <is> Root
Climate Change Commitment: CO2 Emissions cap <contradicts> Easy to control atmospheric emissions within limits set by regulations
Waste regulation and IS exchanges <is associated with> Climate Change Commitment: CO2 Emissions cap
Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges
CHALLENGES <is associated with> Regulatory barriers to waste exchange
Waste regulation and IS exchanges <is associated with> Easy to control atmospheric emissions within limits set by regulations

ECONOMIC BARRIERS <is> Root

CHALLENGES <is associated with> ECONOMIC BARRIERS

Having the ISO 14,001 does not guarantee that your clients are going to buy you <is part of> ECONOMIC BARRIERS

Some environmental investments won't payback <is associated with> Having the ISO 14,001 does not guarantee that your clients are going to buy you

CHALLENGES <is associated with> Some environmental investments won't payback
There is no restriction to environmental investments required by regulation <is associated with> Some environmental investments won't payback

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with> There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Some environmental investments won't payback <is part of> ECONOMIC BARRIERS

Economic benefits/savings of better environmental management <is> Root

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Economic benefits/savings of better environmental management <is associated with>

The process of approval of environmental investments

Economic cost of using sea water for production is to high <is> Root

Elimination of chromium VI <is> Root

EMS and environmental investments <is> Root

Environmental decision making <is associated with> EMS and environmental investments

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

EMS documentation <is> Root

EMS process <is> Root

EMS: advantages <is> Root

Environmental committee has periodical meetings <is> Root

Environmental communication and training <is> Root

Environmental decision making <is> Root

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

Environmental impacts of etching <is> Root

Environmental impacts: electrozincate <is> Root

Environmental investments <is> Root

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> Environmental investments

Environmental investments and licence to operate <is> Root

Environmental investments are generally approved while production investments have to compete with other plants <is> Root

Main environmental investments <is associated with> Environmental investments are generally approved while production investments have to compete with other plants

Proactive attitude to comply with all environmental requirements <is associated with>

Main environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Main environmental investments

The process of approval of environmental investments <is associated with> Main environmental investments

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

There is no restriction to environmental investments required by regulation <is cause of> Environmental investments are generally approved while production investments have to compete with other plants

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with> There is no restriction to environmental investments required by regulation

Environmental management as a cost for the company <is> Root

Environmental objectives <is> Root

Environmental permit approval follow very long administrative processes <is> Root

Communication with regulatory bodies/agents <is associated with> Environmental permit approval follow very long administrative processes

Environmental programme and internal revision of the system <is> Root

Environmental ranking of plants <is> Root

Environmental regulation in Europe may compromise profitability of industrial companies <is> Root

Future regulations <is associated with> Environmental regulation in Europe may compromise profitability of industrial companies

Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Environmental regulations and competitive position <is> Root

Environmental decision making <is cause of> Environmental regulations and competitive position

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

Environmental regulation in Europe may compromise profitability of industrial companies <is associated with> Environmental regulations and competitive position

Future regulations <is associated with> Environmental regulation in Europe may compromise profitability of industrial companies

Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of>

Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Etching <is> Root

etching steel coils warehouse <is> Root

Examination and analytical procedures of alternative raw materials <is> Root

Examination of new raw materials <is> Root

Exploration of potential IS exchanges <is> Root

Identification of potential IS exchange ties: Alternative raw materials <is associated with>

Exploration of potential IS exchanges

Reduction of CO2 emissions by substitution of fuels using biomass <is part of>

Identification of potential IS exchange ties: Alternative raw materials

Some benefits are generated from the reuse and recycle of waste streams <is associated with> Reduction of CO2 emissions by substitution of fuels using biomass

Economic benefits/savings of better environmental management <is associated with> Some benefits are generated from the reuse and recycle of waste streams

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Management of waste streams <is associated with> Some benefits are generated from the reuse and recycle of waste streams

OPPORTUNITIES <is associated with> Management of waste streams
Integration in the community <is associated with> OPPORTUNITIES

External driver: community <is> Root

External drivers: car industry <is> Root

External drivers: clients don't require ISO 14,001 <is> Root

Having the ISO 14,001 does not guarantee that your clients are going to buy you <is part of>
External drivers: clients don't require ISO 14,001

Some environmental investments won't payback <is associated with> Having the ISO 14,001 does not guarantee that your clients are going to buy you

CHALLENGES <is associated with> Some environmental investments won't payback
There is no restriction to environmental investments required by regulation <is associated with> Some environmental investments won't payback

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with> There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Factory open days <is> Root

Final product: cold laminated steel <is> Root

fly ash for grinding <is> Root

Future environmental actions/investments <is> Root

Future regulations <is associated with> Future environmental actions/investments

Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of>

Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Leading environmental positioning <is associated with> Future environmental actions/investments

Proactive attitude to comply with all environmental requirements <is associated with> Future environmental actions/investments

Future regulations <is> Root

Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

good communication <is> Root

Groundwater wells <is> Root

Having the ISO 14,001 does not guarantee that your clients are going to buy you <is> Root

Some environmental investments won't payback <is associated with> Having the ISO 14,001 does not guarantee that your clients are going to buy you

CHALLENGES <is associated with> Some environmental investments won't payback

There is no restriction to environmental investments required by regulation <is associated

with> Some environmental investments won't payback
 Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation
 Proactive attitude to comply with all environmental requirements <is associated with> There is no restriction to environmental investments required by regulation
 Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
 Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
 OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements
 Integration in the community <is associated with> OPPORTUNITIES
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Hot dip galvanising <is> Root

Identification of potential IS exchange ties: Alternative raw materials <is> Root
 Reduction of CO2 emissions by substitution of fuels using biomass <is part of> Identification of potential IS exchange ties: Alternative raw materials
 Some benefits are generated from the reuse and recycle of waste streams <is associated with> Reduction of CO2 emissions by substitution of fuels using biomass
 Economic benefits/savings of better environmental management <is associated with> Some benefits are generated from the reuse and recycle of waste streams
 Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
 The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
 Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
 Management of waste streams <is associated with> Some benefits are generated from the reuse and recycle of waste streams
 OPPORTUNITIES <is associated with> Management of waste streams
 Integration in the community <is associated with> OPPORTUNITIES

Implications of the enforcement of the IPPC <is> Root

Environmental regulation in Europe may compromise profitability of industrial companies <is associated with> Implications of the enforcement of the IPPC
 Future regulations <is associated with> Environmental regulation in Europe may compromise profitability of industrial companies
 Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations
 Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
 Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
 OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements
 Integration in the community <is associated with> OPPORTUNITIES
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Importance of alternative fuels % <is> Root

Improvements generated as a consequence of the EMS <is> Root

Inspections <is> Root

Integral Environmental Autorisation <is> Root

Integration f systems <is> Root

Integration in the community <is> Root

Integration of environmental and worker security policies <is> Root

intermediary warehouse to regulate the process <is> Root

Internal audit <is> Root

Internal driver <is> Root

Internal environmental objectives go far beyond environmental regulation <is> Root

Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Introduction of environmental principle in investment's approval procedure <is> Root
Investments' approval procedure <is associated with> Introduction of environmental principle in investment's approval procedure
The process of approval of environmental investments <is part of> Investments' approval procedure
Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
Proposal of improvements <is associated with> Introduction of environmental principle in investment's approval procedure

Investments' approval procedure <is> Root
The process of approval of environmental investments <is part of> Investments' approval procedure
Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

IPPC regulation: revision of the regulation including cement grinding companies <is> Root

IS by-product: Zinc pot <is> Root

IS exchange didn't work <is> Root
CHALLENGES <is associated with> IS exchange didn't work

IS exchange: minimum volume <is> Root
IS exchange didn't work <is associated with> IS exchange: minimum volume
CHALLENGES <is associated with> IS exchange didn't work

IS exchange: old blast furnace <is> Root

IS exchange: sludge to cement company <is> Root
Waste regulation and IS exchanges <is associated with> IS exchange: sludge to cement company
Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges
CHALLENGES <is associated with> Regulatory barriers to waste exchange

IS flow: shared use of waste treatment plant <is> Root

IS obstacle: sludge does not comply with chemical requirements defined by the cement factory <is> Root
IS exchange didn't work <is associated with> IS obstacle: sludge does not comply with chemical requirements defined by the cement factory
CHALLENGES <is associated with> IS exchange didn't work

IS opportunities with neighbouring companies <is> Root

IS opportunities: economic benefits <is> Root

IS opportunities: infrastructures sharing <is> Root

IS: Maintenance oils are valorised by an external waste manager <is> Root

IS: recovery of solvents <is> Root

ISO 14,001 <is> Root

ISO 14,001 certification <is> Root

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is> Root

It is difficult to define new objectives and target after a few years <is> Root

Future environmental actions/investments <is associated with> It is difficult to define new objectives and target after a few years

Future regulations <is associated with> Future environmental actions/investments

Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations

Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Leading environmental positioning <is associated with> Future environmental actions/investments

Proactive attitude to comply with all environmental requirements <is associated with> Future environmental actions/investments

Lack of technical capability of municipal authorities <is> Root

Conflict with municipal authorities <is associated with> Lack of technical capability of municipal authorities

Waste regulation and IS exchanges <is associated with> Conflict with municipal authorities

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS

exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange
Regulatory bodies do not have qualified personnel for the enforcement of IPPC <is associated with> Lack of technical capability of municipal authorities
Conflict with municipal authorities <is associated with> Regulatory bodies do not have qualified personnel for the enforcement of IPPC

Leading environmental positioning <is> Root

Low priority of environmental issues <is> Root

Main activity of the company <is> Root

Main alternative raw materials: ceramics, fly ash <is> Root

Main clients: car industry, domestic appliances and constructions <is> Root

Main environmental impacts: lamination and re-cooking <is> Root

Main environmental investments <is> Root

Proactive attitude to comply with all environmental requirements <is associated with> Main environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Main environmental investments

The process of approval of environmental investments <is associated with> Main environmental investments

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Main fuels <is> Root

Main production process: Lamination <is> Root

Main raw materials come from companies in the area <is> Root

main waste streams <is> Root

Management of alternative liquid fuels <is> Root

Management of waste streams <is> Root

OPPORTUNITIES <is associated with> Management of waste streams
Integration in the community <is associated with> OPPORTUNITIES

Material balances <is> Root

Maximizing recycling rates <is> Root

Management of waste streams <is associated with> Maximizing recycling rates
OPPORTUNITIES <is associated with> Management of waste streams
Integration in the community <is associated with> OPPORTUNITIES

Mutual control and communication with neighbouring companies <is> Root

Need to go beyond current EMS towards the integration of eco-efficiency <is> Root

Relevance of environmental principles in the strategy of the company <is associated with>
Need to go beyond current EMS towards the integration of eco-efficiency
OPPORTUNITIES <is associated with> Relevance of environmental principles in the
strategy of the company
Integration in the community <is associated with> OPPORTUNITIES

Negotiation of prices for alternative fuels <is> Root

Negotiation of prices of alternative raw materials <is> Root

No collaboration with neighbouring companies <is> Root

CHALLENGES <is associated with> No collaboration with neighbouring companies
Collaboration with companies that formerly belonged to the same group <is associated with>
No collaboration with neighbouring companies
OPPORTUNITIES <is associated with> Collaboration with companies that formerly
belonged to the same group
Integration in the community <is associated with> OPPORTUNITIES
Some occasional informal contacts with neighbouring plants in environmental issues <is
associated with> Collaboration with companies that formerly belonged to the same group
Mutual control and communication with neighbouring companies <is part of> Some
occasional informal contacts with neighbouring plants in environmental issues
No communication with external agents <is associated with> Some occasional
informal contacts with neighbouring plants in environmental issues
CHALLENGES <is associated with> No communication with external agents
OPPORTUNITIES <is associated with> Some occasional informal contacts with
neighbouring plants in environmental issues
No collaboration within the group <is associated with> No collaboration with neighbouring
companies

No collaboration within the group <is> Root

No communication at all with neighbouring companies <is> Root

No collaboration with neighbouring companies <is associated with> No communication at all

with neighbouring companies

CHALLENGES <is associated with> No collaboration with neighbouring companies
Collaboration with companies that formerly belonged to the same group <is associated with> No collaboration with neighbouring companies

OPPORTUNITIES <is associated with> Collaboration with companies that formerly belonged to the same group

Integration in the community <is associated with> OPPORTUNITIES

Some occasional informal contacts with neighbouring plants in environmental issues <is associated with> Collaboration with companies that formerly belonged to the same group

Mutual control and communication with neighbouring companies <is part of>

Some occasional informal contacts with neighbouring plants in environmental issues

No communication with external agents <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

CHALLENGES <is associated with> No communication with external agents

OPPORTUNITIES <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

No collaboration within the group <is associated with> No collaboration with neighbouring companies

No communication with external agents <is associated with> No communication at all with neighbouring companies

No communication with external agents <is> Root

CHALLENGES <is associated with> No communication with external agents

No regular communication with regulatory bodies <is> Root

Waste regulation and IS exchanges <is associated with> No regular communication with regulatory bodies

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Only information exchange no material exchange <is> Root

Operative decisions are taken by the plant <is> Root

Main environmental investments <is part of> Operative decisions are taken by the plant

Proactive attitude to comply with all environmental requirements <is associated with>

Main environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental

requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Main environmental investments

The process of approval of environmental investments <is associated with> Main environmental investments

Economic benefits/savings of better environmental management <is associated with>

The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with>

Costs and benefits of environmental management

OPPORTUNITIES <is> Root

Integration in the community <is associated with> OPPORTUNITIES

Opportunities to introduce new waste streams into the production process <is> Root

Organisation and assignation of environmental roles: cooperation within the group <is> Root

Origin of raw materials <is> Root

Other low volume waste streams <is> Root

Paper and cardboard: external recyclers <is> Root

Payback time for environmental investments <is> Root

Some environmental investments won't payback <is associated with> Payback time for environmental investments

CHALLENGES <is associated with> Some environmental investments won't payback

There is no restriction to environmental investments required by regulation <is associated with> Some environmental investments won't payback

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with>

There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

There is no restriction to environmental investments required by regulation <is associated with> Payback time for environmental investments

Periodical meetings of environmental committee <is> Root

Plant cross comparissons and case studies <is> Root

Plant was already certified before it was a requirement of clients <is> Root

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is> Root

Possible use of sludge in cement companies <is> Root

Proactive attitude to comply with all environmental requirements <is> Root

- Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements
 - The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
 - Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
- OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements
 - Integration in the community <is associated with> OPPORTUNITIES
 - The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Production phase: clinker grinding <is> Root

Production phase: cooling <is> Root

Production phase: electrozincate <is> Root

Production phase: grinding <is> Root

Production phase: homegenization of raw metrials <is> Root

Production phase: oven cooking <is> Root

Production phase: selection of raw materials <is> Root

Production process: phases <is> Root

Production process: re-cooking <is> Root

Production process: surface tempering <is> Root

Proposal of improvements <is> Root

Re-cooked coil warehouse <is> Root

REACH <is> Root

Future environmental actions/investments <is associated with> REACH
 Future regulations <is associated with> Future environmental actions/investments
 Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations
 Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation
 Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
 Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
 OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements
 Integration in the community <is associated with> OPPORTUNITIES
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements
 Leading environmental positioning <is associated with> Future environmental actions/investments
 Proactive attitude to comply with all environmental requirements <is associated with> Future environmental actions/investments

recovery of acid from fume cleaning system <is> Root

Reduction of CO2 emissions by substitution of fuels using biomass <is> Root
 Some benefits are generated from the reuse and recycle of waste streams <is associated with> Reduction of CO2 emissions by substitution of fuels using biomass
 Economic benefits/savings of better environmental management <is associated with> Some benefits are generated from the reuse and recycle of waste streams
 Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management
 The process of approval of environmental investments <is associated with> Costs and benefits of environmental management
 Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments
 Management of waste streams <is associated with> Some benefits are generated from the reuse and recycle of waste streams
 OPPORTUNITIES <is associated with> Management of waste streams
 Integration in the community <is associated with> OPPORTUNITIES

Reduction of total emissions <is> Root

Regeneration of acid within the plant <is> Root

Regenerative thermal oxidation for the control of VOC's <is> Root

Regulation is preventing wood recycling <is> Root

Waste regulation and IS exchanges <is associated with> Regulation is preventing wood recycling
 Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges
 CHALLENGES <is associated with> Regulatory barriers to waste exchange

Regulatory barriers to waste exchange <is> Root
 CHALLENGES <is associated with> Regulatory barriers to waste exchange

Regulatory bodies do not have qualified personnel for the enforcement of IPPC <is> Root
 Conflict with minicipal authorities <is associated with> Regulatory bodies do not have qualified personnel for the enforcement of IPPC
 Waste regulation and IS exchanges <is associated with> Conflict with minicipal authorities
 Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges
 CHALLENGES <is associated with> Regulatory barriers to waste exchange

Relationship with regulatory bodies <is> Root

relevance given to Environmental management <is> Root

Relevance of alternative raw materials % <is> Root

Relevance of environmental principles in the strategy of the company <is> Root
 OPPORTUNITIES <is associated with> Relevance of environmental principles in the strategy of the company
 Integration in the community <is associated with> OPPORTUNITIES

Reluctancy to collaborate with neighbouring companies <is> Root

Reluctancy to provide information in futere investments or future regulations <is> Root

Restrictive communication policy hinder any attempt to collaborate with neighbouring companies <is> Root

Reuse of treated waste water for dissolution of lime <is> Root

RoHs <is> Root
 Future environmental actions/investments <is associated with> RoHs
 Future regulations <is associated with> Future environmental actions/investments
 Internal environmental objectives go far beyond environmental regulation <is cause of> Future regulations
 Proactive attitude to comply with all environmental requirements <is cause of> Internal environmental objectives go far beyond environmental regulation
 Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements
 The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
 Leading environmental positioning <is associated with> The direction

of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Leading environmental positioning <is associated with> Future environmental actions/investments

Proactive attitude to comply with all environmental requirements <is associated with> Future environmental actions/investments

Role of the group environmental coordinator <is> Root

Security <is> Root

Self control and monitoring of emissions and effluents <is> Root

Several types of cement products <is> Root

sludge <is> Root

Sludge cannot be used as by-product due to its classification as a waste <is> Root

Waste regulation and IS exchanges <is associated with> Sludge cannot be used as by-product due to its classification as a waste

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Sludge: non hazardous <is> Root

Some benefits are generated from the reuse and recycle of waste streams <is> Root

Economic benefits/savings of better environmental management <is associated with> Some benefits are generated from the reuse and recycle of waste streams

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Management of waste streams <is associated with> Some benefits are generated from the reuse and recycle of waste streams

OPPORTUNITIES <is associated with> Management of waste streams

Integration in the community <is associated with> OPPORTUNITIES

Some environmental investments won't payback <is> Root

CHALLENGES <is associated with> Some environmental investments won't payback

There is no restriction to environmental investments required by regulation <is associated with> Some environmental investments won't payback

Pollution control technologies won't payback in economic terms but more heuristic

approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with>

There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Some informal communication with neighbouring companies <is> Root

Some occasional informal contacts with neighbouring plants in environmental issues <is> Root

Mutual control and communication with neighbouring companies <is part of> Some occasional informal contacts with neighbouring plants in environmental issues

No communication with external agents <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

CHALLENGES <is associated with> No communication with external agents

OPPORTUNITIES <is associated with> Some occasional informal contacts with neighbouring plants in environmental issues

Integration in the community <is associated with> OPPORTUNITIES

Substitution of chromium VI and Nickel <is> Root

Substitution of raw materials for waste streams reduced cost of production <is> Root

Successful achievement of environmental objectives <is> Root

Tax reduction for environmental investments <is> Root

Economic benefits/savings of better environmental management <is associated with> Tax reduction for environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Main environmental investments <is associated with> Tax reduction for environmental investments

Proactive attitude to comply with all environmental requirements <is associated with>

Main environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making
Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements
OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements
Integration in the community <is associated with> OPPORTUNITIES
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements
The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Main environmental investments
The process of approval of environmental investments <is associated with> Main environmental investments

TECHNICAL BARRIERS <is> Root

Difficulty to find suitable waste streams in high volumes <is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with> Difficulty to find suitable waste streams in high volumes

CHALLENGES <is associated with> IS exchange didn't work

IS exchange: minimum volume <is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with> IS exchange: minimum volume

IS obstacle: sludge does not comply with chemical requirements defined by the cement factory <is part of> TECHNICAL BARRIERS

IS exchange didn't work <is associated with> IS obstacle: sludge does not comply with chemical requirements defined by the cement factory

The direction of the group set as a priority to be up to date with all environmental requirements <is> Root

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

The process of approval of environmental investments <is> Root

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

There is a budget for environmental improvements <is> Root

Operative decisions are taken by the plant <is associated with> There is a budget for environmental improvements

Main environmental investments <is part of> Operative decisions are taken by the plant

Proactive attitude to comply with all environmental requirements <is associated with> Main environmental investments

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all

environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Main environmental investments

The process of approval of environmental investments <is associated with> Main environmental investments

Economic benefits/savings of better environmental management <is associated with> The process of approval of environmental investments

Costs and benefits of environmental management <is part of> Economic benefits/savings of better environmental management

The process of approval of environmental investments <is associated with> Costs and benefits of environmental management

There is no restriction to environmental investments required by regulation <is> Root

Pollution control technologies won't payback in economic terms but more heuristic approach of social gains justify their adoption <is associated with> There is no restriction to environmental investments required by regulation

Proactive attitude to comply with all environmental requirements <is associated with> There is no restriction to environmental investments required by regulation

Environmental decision making <is associated with> Proactive attitude to comply with all environmental requirements

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Environmental decision making

Leading environmental positioning <is associated with> The direction of the group set as a priority to be up to date with all environmental requirements

OPPORTUNITIES <is associated with> Proactive attitude to comply with all environmental requirements

Integration in the community <is associated with> OPPORTUNITIES

The direction of the group set as a priority to be up to date with all environmental requirements <is associated with> Proactive attitude to comply with all environmental requirements

Transport costs <is> Root

CHALLENGES <is associated with> Transport costs

Transport of raw materials and final products <is> Root

Transport of waste streams <is> Root

Transport costs <is associated with> Transport of waste streams

CHALLENGES <is associated with> Transport costs

Trust based on secrecy and confidentiality <is> Root

Confidentiality policy <is part of> Trust based on secrecy and confidentiality

Competence regulation and communication policy of the company does not allow exchange of information with third actors <is associated with> Confidentiality policy

It is assumed that neighbouring companies generate different waste streams and there is no potential for cooperation <is associated with> Competence regulation and communication policy of the company does not allow exchange of information with third actors

Types of waste streams <is> Root

Use of oil emulsion in lamination <is> Root

Use of waste streams is limited by valorisation installations and waste market <is> Root

Use of water: cooling of gases and refrigeration <is> Root

Valorisation installations: requirements <is> Root

Valorisation of waste and IS exchanges payback <is> Root

Warehouse warm rolled coil <is> Root

Waste management <is> Root

waste manager and waste producer <is> Root

Waste managers and responsibility <is> Root

Waste regulation and IS exchanges <is associated with> Waste managers and responsibility
Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Waste regulation and IS exchanges <is> Root

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Waste regulation has prevented possible by-product exchanges <is> Root

Waste regulation and IS exchanges <is associated with> Waste regulation has prevented possible by-product exchanges

Regulatory barriers to waste exchange <is associated with> Waste regulation and IS exchanges

CHALLENGES <is associated with> Regulatory barriers to waste exchange

Waste stream: exhausted acid <is> Root

Waste treatment plant <is> Root

waste treatment plant process <is> Root

Waste use and types of water quality <is> Root

waste valorisation in cement companies <is> Root

We are prepared for the future <is> Root

white cement and grey cement <is> Root

who initiates the IS exchange tie? <is> Root

Wood package <is> Root

Working with the best waste managers <is> Root

5. Primary document-codes

CODES-PRIMARY-DOCUMENTS-TABLE (CELL=Q-FREQ)
 Report created by Super - 10/05/2010 17:14:46
 "HU: [R:\PHD\SAGUNTO1.hpr5]"

Code-Filter: All [260]
 PD-Filter: All [8]
 Quotation-Filter: All [262]

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--
CODES                PRIMARY DOCS
Totals              1      2      3      4      5      6      7      8
-----
--
A regional regulatio  0      0      0      0      0      1      0      0
1
Absence of regular i  0      0      1      0      0      0      0      0
1
Acid regeneration wa  0      0      0      0      0      1      0      0
1
Administrative proce  0      0      0      0      0      2      0      0
2
Advantages of valori  2      0      0      0      0      0      0      0
2
Alternative fuels     1      0      0      0      0      0      0      0
1
Alternative liquid f  1      0      0      0      0      0      0      0
1
Alternative raw mate  1      0      0      0      0      0      0      0
1
Another company runs  0      1      0      0      0      0      0      0
1
Approval of environm  0      1      0      0      0      0      0      0
1
Approval of new inpu  0      1      0      0      0      0      0      0
1
Assignment of roles  0      0      0      0      0      0      1      0
1
ATmospheric emission 1      0      0      0      0      0      0      0
1
Atmospheric emission 1      0      0      0      0      0      0      0
1
Atmospheric emission 1      0      0      0      0      0      0      0
1
Atmospheric emission 0      1      0      0      0      0      0      0
1
Atmospheric emission 1      0      0      1      0      0      0      0
2
ATmospheric emission 0      1      0      0      0      0      0      0
1
Attempt to valorise  0      1      0      0      0      0      0      0
1
  
```

BAT adopted througho 2	0	0	0	0	2	0	0	0
BATs 2	1	0	0	0	1	0	0	0
better control of en 1	0	0	1	0	0	0	0	0
biomass 1	1	0	0	0	0	0	0	0
Bottom-up approach: 2	0	1	0	1	0	0	0	0
By-product clinker 1	1	0	0	0	0	0	0	0
By-product laminatio 1	0	1	0	0	0	0	0	0
By-product: Clinker 1	1	0	0	0	0	0	0	0
By-product: Full har 1	0	1	0	0	0	0	0	0
By-product: iron oxi 1	0	1	0	0	0	0	0	0
By-products and recy 1	0	0	0	0	0	0	0	1
By-products: full-ha 1	0	1	0	0	0	0	0	0
By-products: sludge 1	0	0	0	0	0	1	0	0
By product: Scrap (t 1	0	1	0	0	0	0	0	0
Cement grinding and 1	0	0	0	1	0	0	0	0
Certifications 1	1	0	0	0	0	0	0	0
CHALLENGES 0	0	0	0	0	0	0	0	0
Changes in productio 2	0	2	0	0	0	0	0	0
Climate Change Commi 1	1	0	0	0	0	0	0	0
co-generation was no 2	0	1	0	1	0	0	0	0
Cogeneration 1	0	0	0	0	1	0	0	0
Cold laminated coils 1	0	1	0	0	0	0	0	0
Cold rolled steel co 1	0	1	0	0	0	0	0	0
Collaboration with c 3	0	1	0	0	0	0	2	0
Collaboration with o 1	0	0	0	0	0	1	0	0
Collaboration within 7	1	1	0	2	0	2	0	1
Combination of inter 1	0	0	0	0	0	0	0	1
Communication policy	0	0	1	0	0	0	0	1

2								
Communication wirth	0	1	0	0	0	0	0	0
1								
Communication with a	0	0	0	0	0	1	0	0
1								
Competence regulatio	0	0	0	0	0	0	0	1
1								
Conditioning of wast	1	0	0	0	0	0	0	0
1								
Confidentiality poli	0	0	0	0	0	0	0	1
1								
Conflict with minuci	0	0	0	0	1	0	0	0
1								
Connexion to other n	0	1	0	0	0	0	0	0
1								
Continous improvemen	0	0	0	1	0	0	0	0
1								
Continuos process	0	1	0	0	0	0	0	0
1								
Control of CO2 emiss	0	1	0	0	0	0	0	0
1								
Cooperation is not b	0	0	0	0	0	0	1	0
1								
Costs and benefits o	0	0	0	0	0	0	0	1
1								
CSR and environmenta	1	0	0	2	0	0	0	0
3								
CSR and license to o	0	0	0	0	0	1	0	0
1								
Decisions concerning	0	0	0	1	0	0	0	0
1								
Defining environment	0	2	1	0	0	1	1	0
5								
Destiny of galvanise	0	1	0	0	0	0	0	0
1								
Differences between	0	1	0	0	0	0	0	0
1								
Different providers	0	0	0	0	0	1	0	0
1								
Difficulty to find s	1	0	0	0	0	0	0	0
1								
Difussed emissions a	0	0	0	1	0	0	0	0
1								
Documentation and co	0	0	1	0	0	0	0	0
1								
Drivers for adoption	1	3	1	1	0	0	1	2
9								
Each plant within th	0	0	0	1	0	0	0	0
1								
Easy to control atmo	0	0	0	1	0	0	0	0
1								
ECONOMIC BARRIERS	0	0	0	0	0	0	0	0
0								
Economic benefits/sa	0	0	0	0	0	0	2	0
2								

Economic cost of use	0	1	0	0	0	0	0	0
1								
Elimination of chrom	0	1	0	0	0	0	0	0
1								
EMS and environmental	1	0	0	0	0	0	1	0
2								
EMS documentation	0	0	0	0	0	1	0	0
1								
EMS process	0	0	0	0	0	1	0	0
1								
EMS: advantages	1	1	1	0	0	0	1	0
4								
Environmental commit	0	1	0	0	0	0	0	0
1								
Environmental commun	0	1	0	0	0	0	0	0
1								
Environmental decisi	0	0	0	2	0	0	0	0
2								
Environmental impact	0	1	0	0	0	0	0	0
1								
Environmental impact	0	1	0	0	0	0	0	0
1								
Environmental invest	1	2	0	2	0	3	0	0
8								
Environmental invest	0	0	0	0	0	2	0	0
2								
Environmental invest	1	0	0	1	0	3	0	0
5								
Environmental manage	0	0	0	0	0	1	0	0
1								
Environmental object	0	1	0	1	0	0	0	0
2								
Environmental permit	0	0	2	0	0	1	0	0
3								
Environmental progra	0	0	0	0	0	1	0	0
1								
Environmental rankin	0	1	0	0	0	0	0	0
1								
Environmental regula	0	0	0	0	0	1	0	0
1								
Environmental regula	0	0	0	0	0	1	0	0
1								
Etching	0	1	0	0	0	0	0	0
1								
etching steel coils	0	1	0	0	0	0	0	0
1								
Examination and anal	1	0	0	0	0	0	0	0
1								
Examination of new r	0	1	0	0	0	0	0	0
1								
Exploration of poten	1	0	0	0	0	0	0	0
1								
External driver: com	0	0	0	3	0	0	0	0
3								
External drivers: ca	0	1	1	0	0	0	1	1

4								
External drivers: cl	0	0	0	1	0	0	0	0
1								
Factory open days	0	1	0	0	0	0	0	0
1								
Final product: cold	0	1	0	0	0	0	0	0
1								
fly ash for grinding	1	0	0	0	0	0	0	0
1								
Future environmental	1	0	1	1	0	2	0	0
5								
Future regulations	1	0	0	0	0	1	0	1
3								
good communication	0	1	0	0	0	0	0	0
1								
Groundwater wells	1	0	0	0	0	0	0	0
1								
Having the ISO 14,00	0	0	0	0	0	2	0	0
2								
Hot dip galvanising	0	1	0	0	0	0	0	0
1								
Identification of po	1	0	0	0	0	0	0	0
1								
Implications of the	1	0	0	1	2	0	2	0
6								
Importance of altern	1	0	0	0	0	0	0	0
1								
Improvements generat	0	1	0	0	0	0	0	0
1								
Inspections	0	0	2	0	0	0	0	0
2								
Integral Environment	1	0	0	0	0	1	0	0
2								
Integration f system	0	1	0	0	0	1	0	0
2								
Integration in the c	1	0	0	0	0	0	0	0
1								
Integration of envir	1	0	0	0	0	0	0	0
1								
intermediary warehou	0	1	0	0	0	0	0	0
1								
Internal audit	0	0	0	0	0	1	0	0
1								
Internal driver	0	2	0	0	0	2	0	0
4								
Internal environment	0	0	0	0	1	0	0	1
2								
Introduction of envi	0	3	1	0	0	0	0	0
4								
Investments' approva	0	3	0	0	0	0	0	0
3								
IPPC regulation: rev	0	0	0	1	0	0	0	0
1								
IS by-product: Zinc	0	0	0	0	0	0	2	0
2								

IS exchange didn't w 1	0	0	0	1	0	0	0	0
IS exchange: minimum 1	1	0	0	0	0	0	0	0
IS exchange: old bla 1	1	0	0	0	0	0	0	0
IS exchange: sludge 2	0	2	0	0	0	0	0	0
IS flow: shared use 1	0	0	0	0	0	0	1	0
IS obstacle: sludge 2	0	2	0	0	0	0	0	0
IS opportunities wit 13	1	6	0	3	1	0	2	0
IS opportunities: ec 1	1	0	0	0	0	0	0	0
IS opportunities: in 3	0	0	0	1	1	0	1	0
IS: Maintenance oils 1	0	1	0	0	0	0	0	0
IS: recovery of solv 1	0	1	0	0	0	0	0	0
ISO 14,001 1	0	0	0	0	0	1	0	0
ISO 14,001 certifica 2	0	2	0	0	0	0	0	0
It is assumed that n 1	0	0	0	0	0	0	0	1
It is difficult to d 1	0	0	0	0	0	1	0	0
Lack of technical ca 2	0	0	0	0	2	0	0	0
Leading environmenta 1	0	0	0	0	1	0	0	0
Low priority of envi 1	0	0	1	0	0	0	0	0
Main activity of the 1	0	1	0	0	0	0	0	0
Main alternative raw 1	1	0	0	0	0	0	0	0
Main clients: car in 1	0	1	0	0	0	0	0	0
Main environmental i 1	0	1	0	0	0	0	0	0
Main environmental i 1	1	0	0	0	0	0	0	0
Main fuels 2	2	0	0	0	0	0	0	0
Main production proc 3	0	3	0	0	0	0	0	0
Main raw materials c 1	0	0	0	0	0	1	0	0
main waste streams 3	1	1	0	1	0	0	0	0
Management of altern 1	1	0	0	0	0	0	0	0

1								
Management of waste	0	0	0	1	0	0	0	0
1								
Material balances	0	0	1	0	0	0	0	0
1								
Maximizing recycling	0	0	0	0	0	0	0	2
2								
Mutual control and c	0	0	0	2	0	0	0	0
2								
Need to go beyond cu	0	0	1	0	0	0	0	0
1								
Negotiation of price	1	0	0	0	0	0	0	0
1								
Negotiation of price	1	0	0	0	0	0	0	0
1								
No collaboration wit	0	0	2	0	0	0	0	0
2								
No collaboration wit	0	0	1	0	0	0	0	0
1								
No communication at	0	0	0	0	0	0	1	0
1								
No communication wit	0	0	1	0	0	0	0	0
1								
No regular communica	0	0	1	0	0	0	0	0
1								
Only information exc	0	0	0	2	0	0	0	0
2								
Operative decisions	0	0	0	1	0	0	0	0
1								
OPPORTUNITIES	0	0	0	0	0	0	0	0
0								
Opportunities to int	1	0	0	0	0	0	0	0
1								
Organisation and ass	1	1	0	0	0	0	0	0
2								
Origin of raw materi	0	1	0	0	0	0	0	0
1								
Other low volume was	0	1	0	0	0	0	0	0
1								
Paper and cardboard:	0	1	0	0	0	0	0	0
1								
Payback time for env	0	1	0	0	0	0	0	0
1								
Periodical meetings	1	0	0	0	0	0	1	0
2								
Plant cross comparis	1	0	0	0	0	0	0	0
1								
Plant was already ce	0	1	0	0	0	0	0	0
1								
Pollution control te	1	0	0	0	0	0	0	0
1								
Possible use of slud	0	1	0	0	0	0	0	0
1								
Proactive attitude t	0	0	0	1	1	0	0	0
2								

Production phase: cl 1	1	0	0	0	0	0	0	0
Production phase: co 1	1	0	0	0	0	0	0	0
Production phase: el 1	0	1	0	0	0	0	0	0
Production phase: gr 1	1	0	0	0	0	0	0	0
Production phase: ho 1	1	0	0	0	0	0	0	0
Production phase: ov 2	2	0	0	0	0	0	0	0
Production phase: se 1	1	0	0	0	0	0	0	0
Production process: 1	1	0	0	0	0	0	0	0
Production process: 1	0	1	0	0	0	0	0	0
Production process: 1	0	1	0	0	0	0	0	0
Proposal of improvem 1	0	1	0	0	0	0	0	0
Re-cooked coil wareh 1	0	1	0	0	0	0	0	0
REACH 3	1	1	0	0	0	1	0	0
recovery of acid fro 1	0	1	0	0	0	0	0	0
Reduction of CO2 emi 1	1	0	0	0	0	0	0	0
Reduction of total e 1	1	0	0	0	0	0	0	0
Regeneration of acid 1	0	1	0	0	0	0	0	0
Regenerative thermal 1	0	0	0	0	0	1	0	0
Regulation is preven 2	0	0	0	0	0	2	0	0
Regulatory barriers 1	0	0	0	0	0	0	0	1
Regulatory bodies do 1	0	0	0	0	1	0	0	0
Relationship with re 1	0	0	1	0	0	0	0	0
relevance given to E 1	0	0	0	0	0	0	1	0
Relevance of alterna 1	1	0	0	0	0	0	0	0
Relevance of environ 1	0	0	0	0	0	1	0	0
Reluctancy to collab 1	0	0	0	0	0	0	0	1
Reluctancy to provid 1	0	0	0	0	0	0	0	1
Restrictive communic 1	0	0	0	0	0	0	0	2

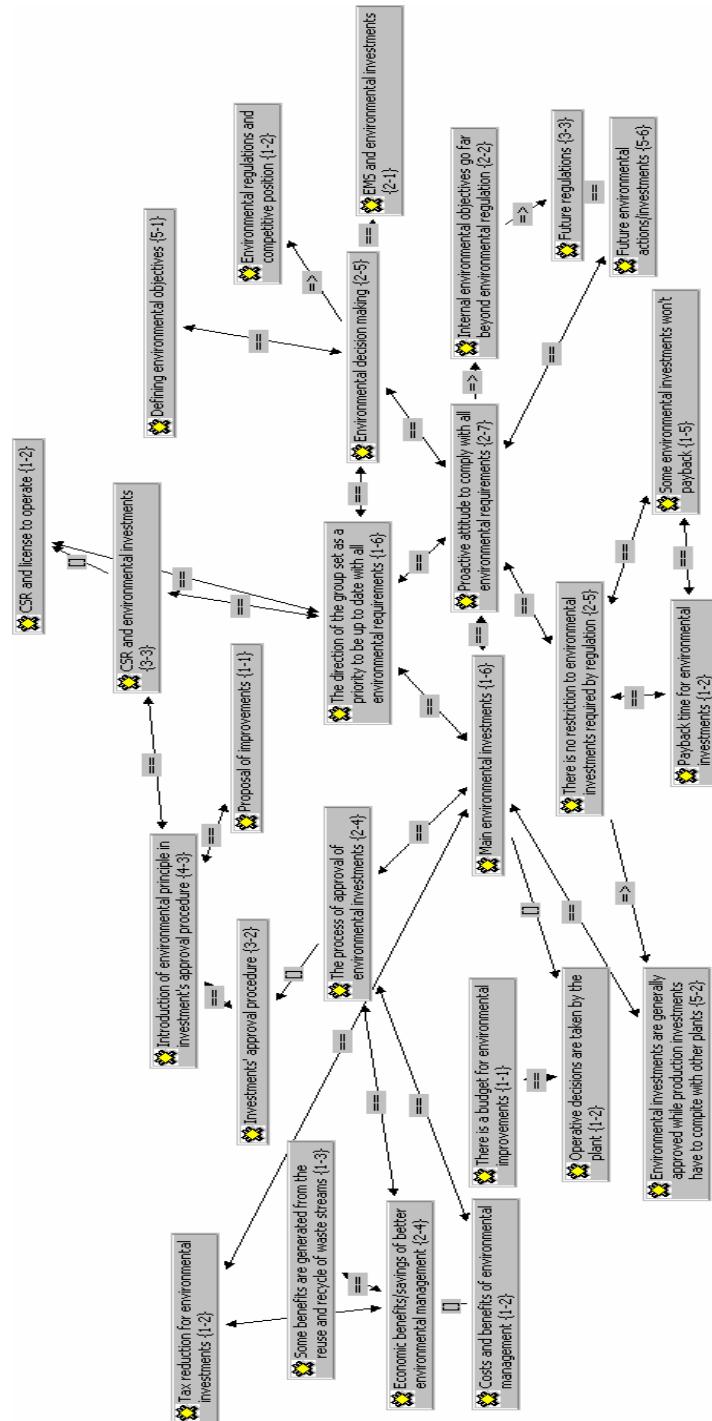
2								
Reuse of treated was	0	1	0	0	0	0	0	0
1								
RoHs	0	0	0	0	0	1	0	0
1								
Role of the group en	0	0	0	0	0	1	0	0
1								
Security	1	0	0	0	0	0	0	0
1								
Self control and mon	0	0	0	0	0	1	0	0
1								
Several types of cem	1	0	0	0	0	0	0	0
1								
sludge	0	1	0	0	0	0	0	0
1								
Sludge cannot be use	0	0	0	0	0	1	0	0
1								
Sludge: non hazardou	0	1	0	0	0	0	0	0
1								
Some benefits are ge	0	0	0	0	0	0	0	1
1								
Some environmental i	0	0	0	0	0	1	0	0
1								
Some informal commun	0	1	0	0	0	0	0	0
1								
Some occasional info	0	0	0	0	0	2	0	0
2								
Substitution of chro	0	1	0	0	0	0	0	0
1								
Substitution of raw	1	0	0	0	0	0	0	0
1								
Successful achieveme	0	1	0	0	0	0	0	0
1								
Tax reduction for en	0	1	0	0	0	0	0	0
1								
TECHNICAL BARRIERS	0	0	0	0	0	0	0	0
0								
The direction of the	0	0	0	0	0	1	0	0
1								
The process of appro	2	0	0	0	0	0	0	0
2								
There is a budget fo	0	0	0	0	0	1	0	0
1								
There is no restrict	0	0	0	0	0	2	0	0
2								
Transport costs	1	0	0	0	0	0	0	0
1								
Transport of raw mat	0	1	0	0	0	0	0	0
1								
Transport of waste s	1	0	0	0	0	0	0	0
1								
Trust based on secre	0	0	0	0	0	0	0	1
1								
Types of waste strea	0	0	0	2	0	0	0	0
2								

Use of oil emulsion	0	1	0	0	0	0	0	0
1								
Use of waste streams	1	0	0	0	0	0	0	0
1								
Use of water: coolin	1	0	0	0	0	0	0	0
1								
Valorisation install	1	0	0	0	0	0	0	0
1								
Valorisation of wast	1	0	0	0	0	0	0	0
1								
Warehouse warm rolle	0	1	0	0	0	0	0	0
1								
Waste management	0	0	0	0	0	2	0	0
2								
waste manager and wa	1	0	0	0	0	0	0	0
1								
Waste managers and r	0	0	0	0	0	1	0	0
1								
Waste regulation and	0	0	0	0	0	3	0	1
4								
Waste regulation has	0	0	0	0	0	3	0	0
3								
Waste stream: exhaus	0	0	0	0	0	1	0	0
1								
Waste treatment plan	0	1	0	0	0	0	0	0
1								
waste treatment plan	0	1	0	0	0	0	0	0
1								
Waste use and types	0	1	0	0	0	0	0	0
1								
waste valorisation i	1	0	0	0	0	0	0	0
1								
We are prepared for	0	0	0	0	0	0	0	1
1								
white cement and gre	1	0	0	0	0	0	0	0
1								
who initiates the IS	1	0	0	0	0	0	0	0
1								
Wood package	0	0	0	0	0	1	0	0
1								
Working with the bes	0	0	0	1	0	0	0	0
1								

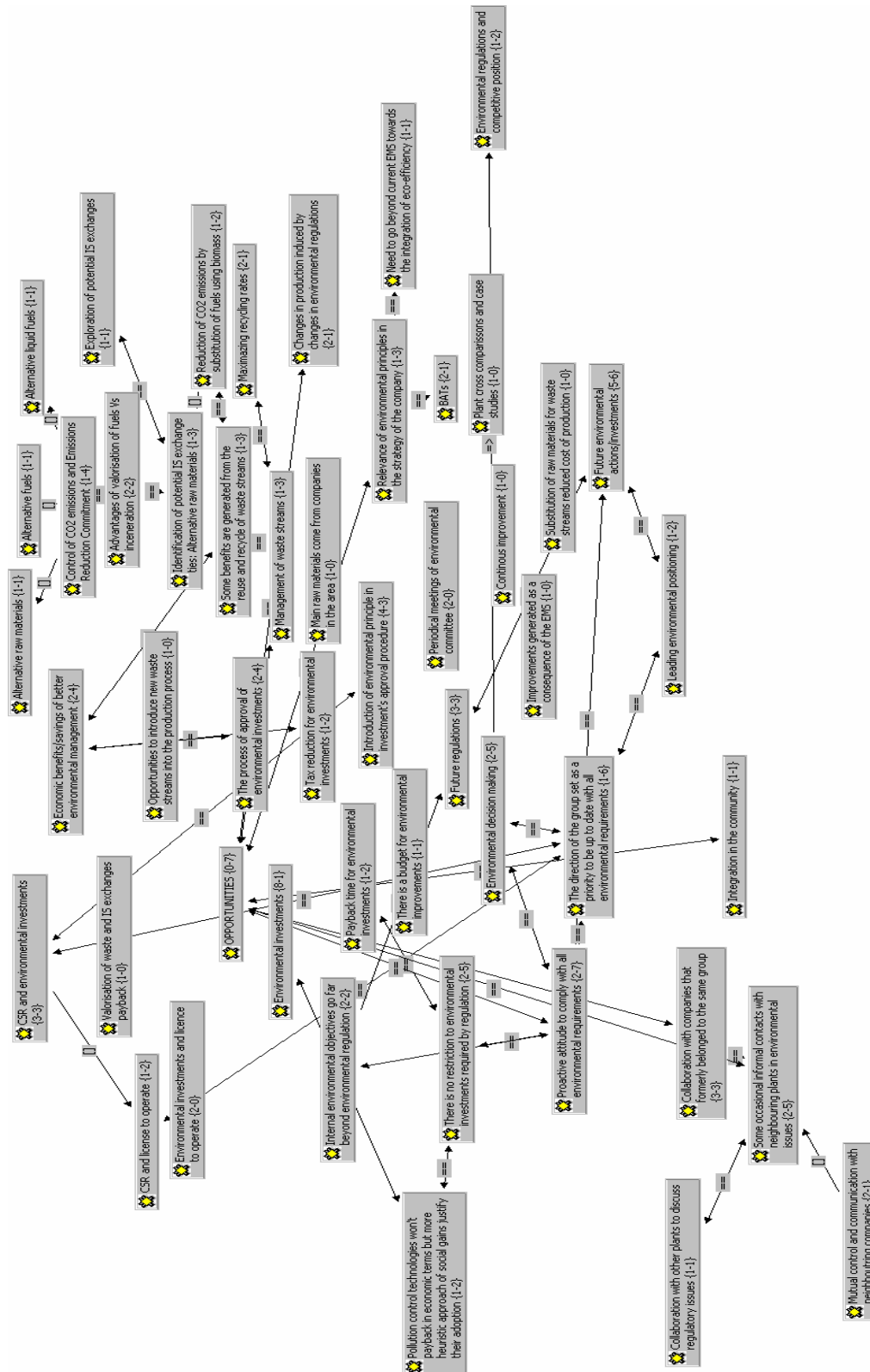
--								
Totals	80	109	23	43	15	67	22	24
383								

6. Network Views

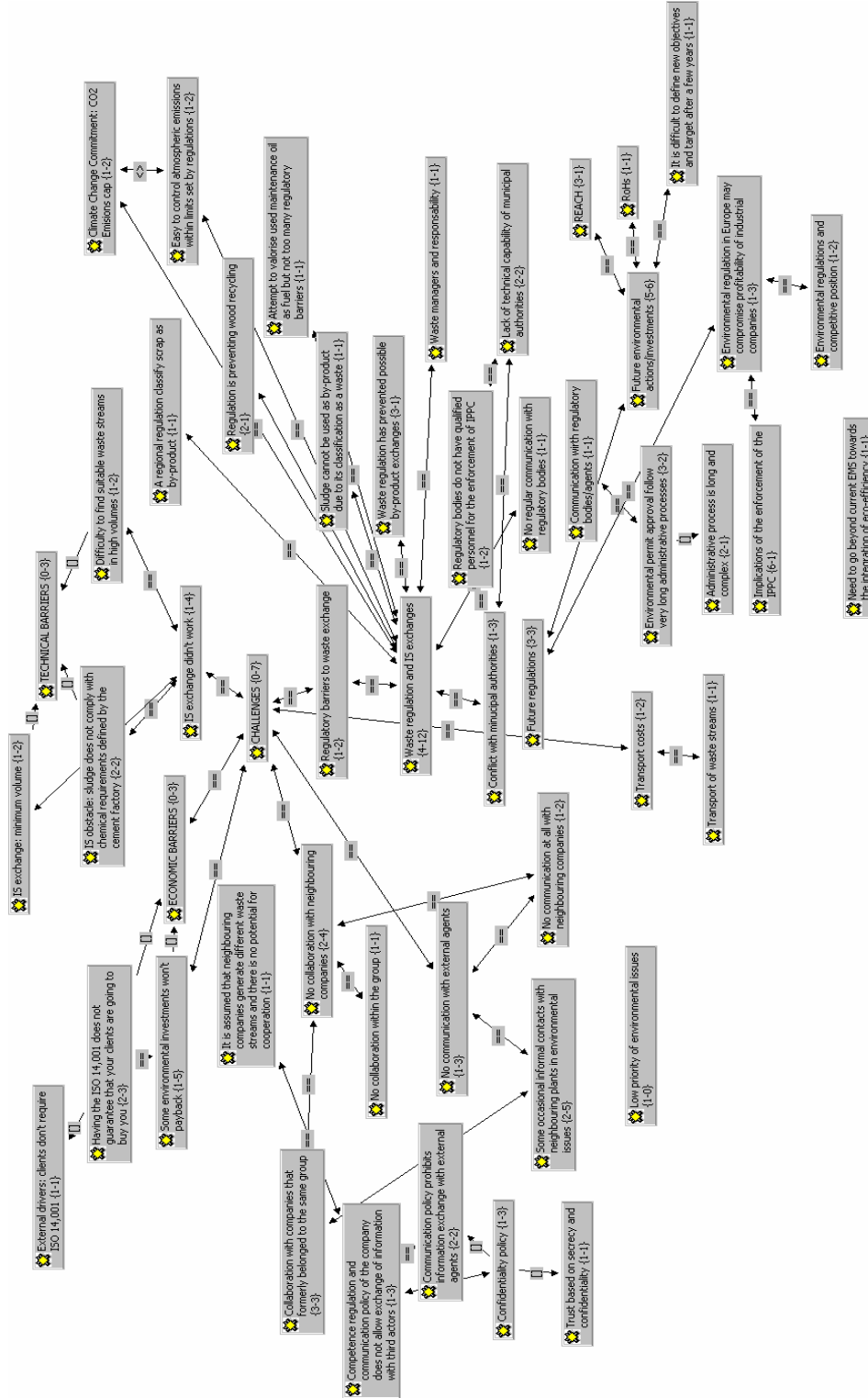
6.1 decision-making



6.2 Opportunities



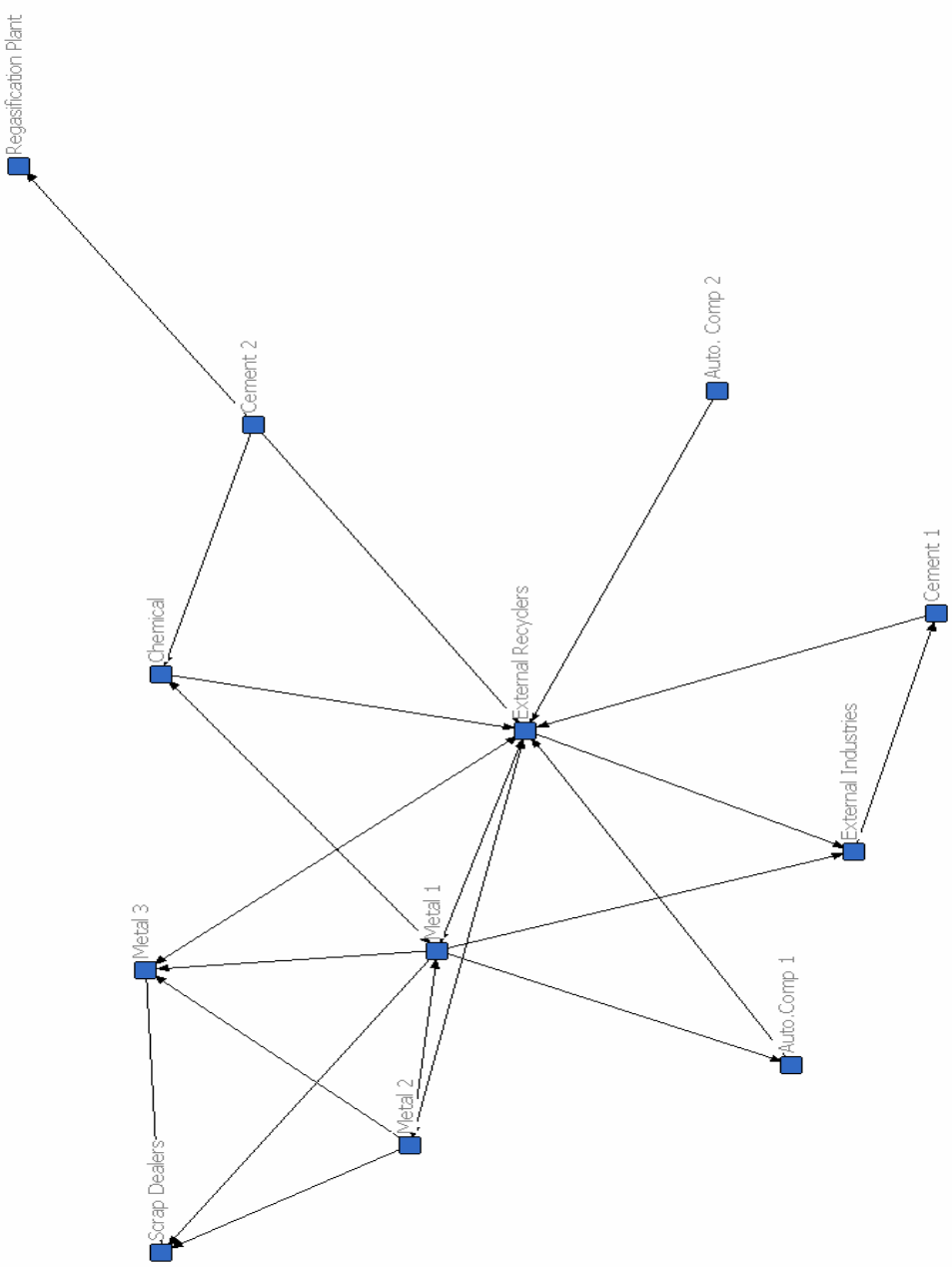
6.3 Challenges



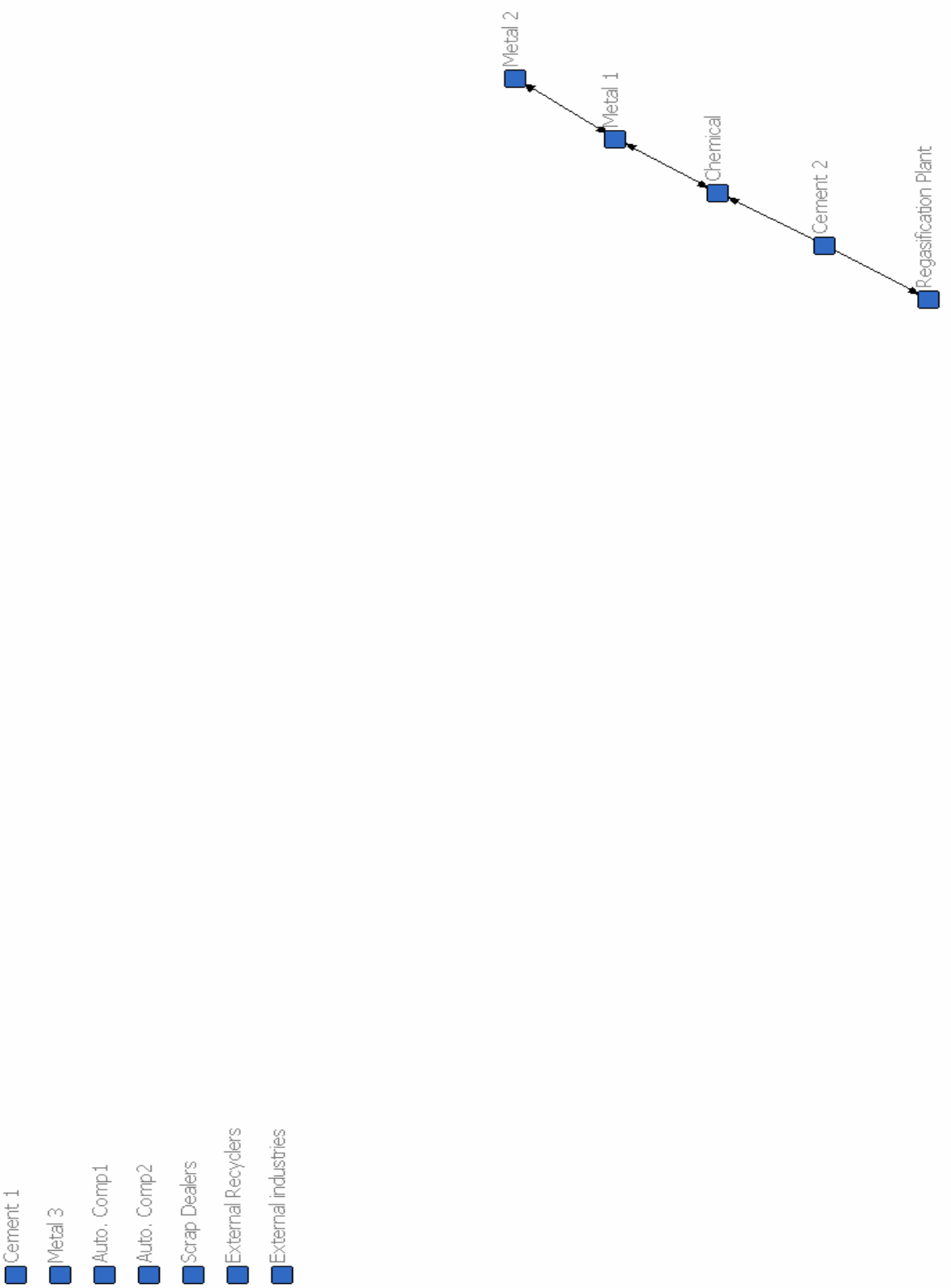
SOCIAL NETWORK ANALYSIS

7. Transactional Networks

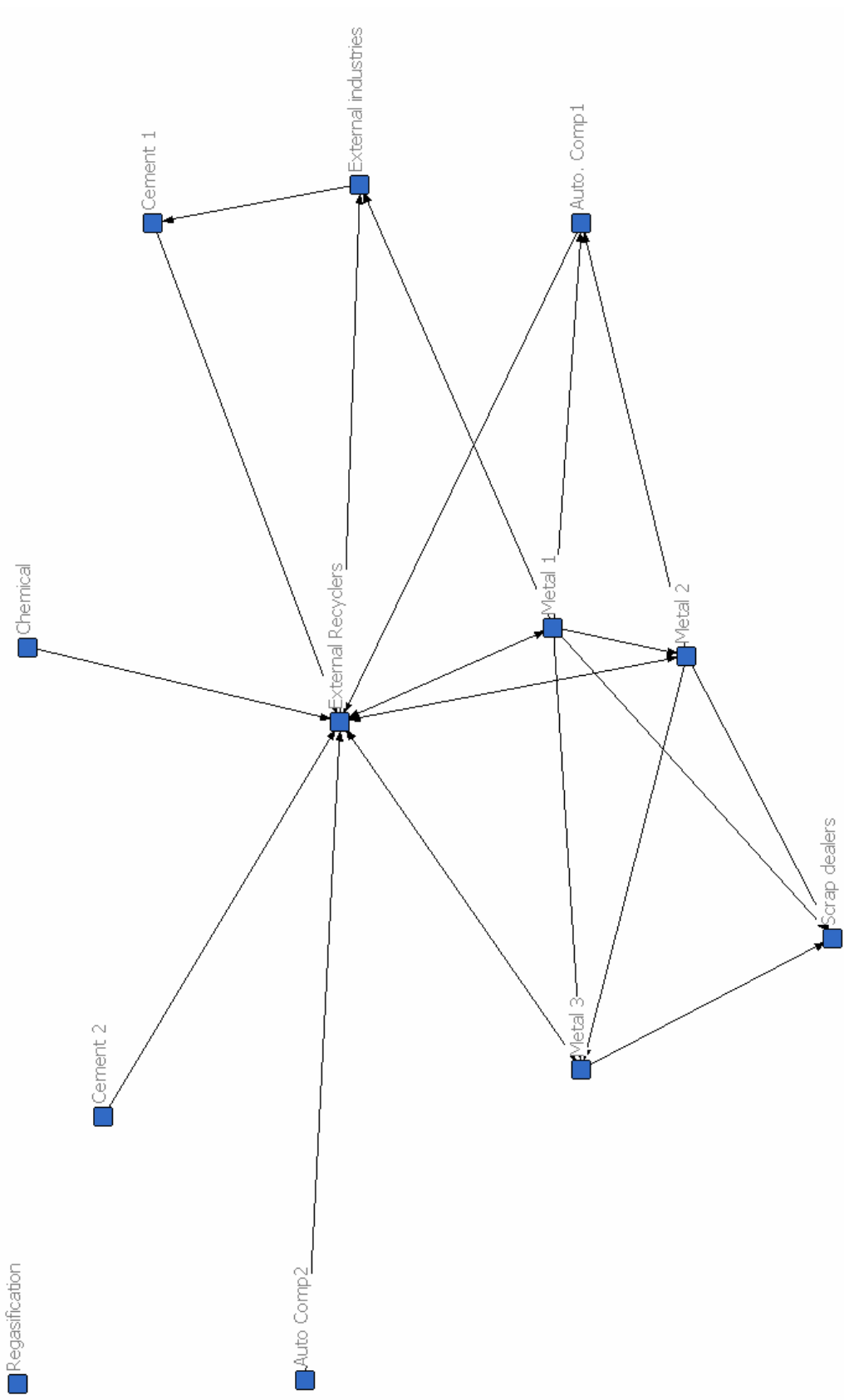
7.1 General Network



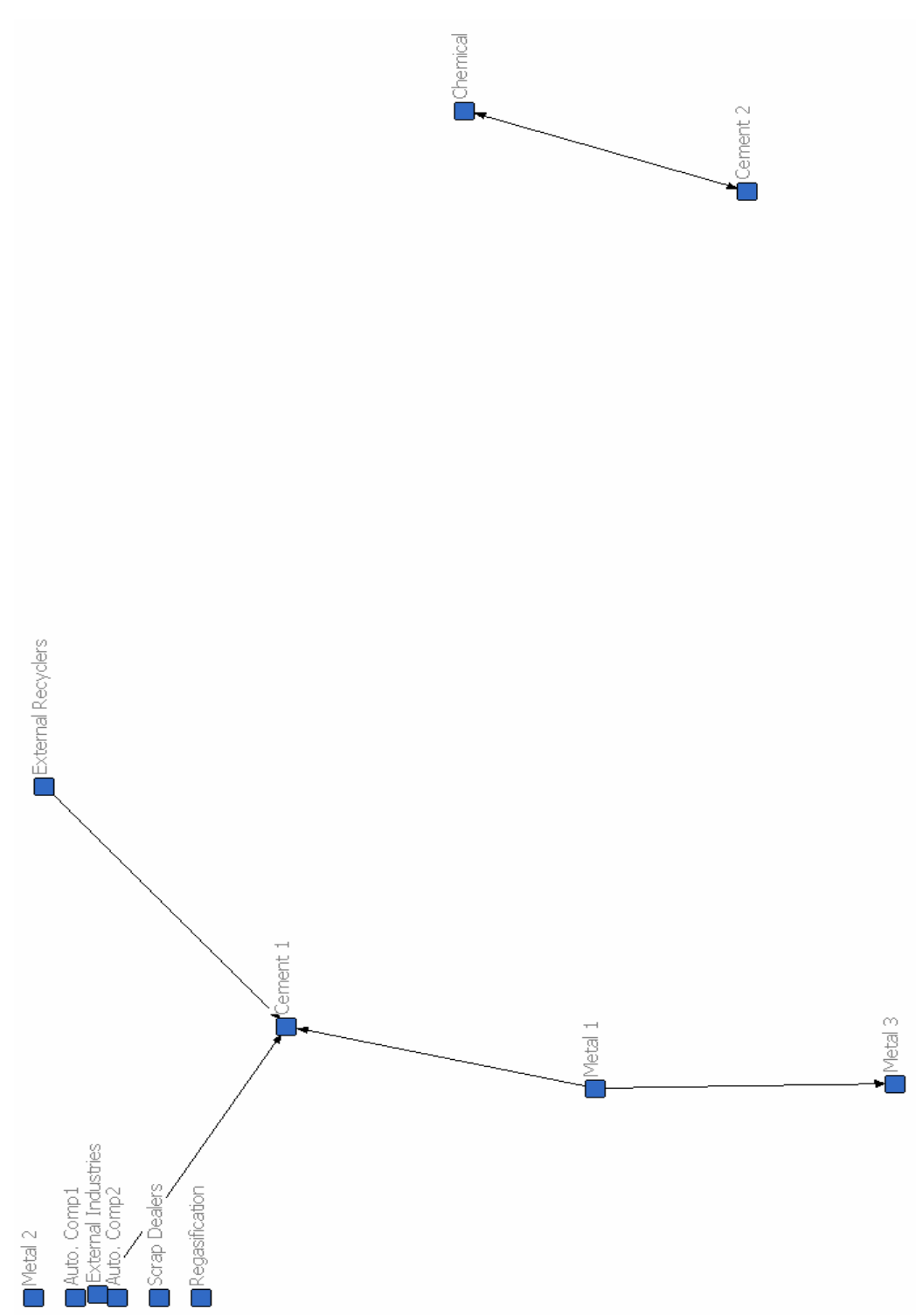
7.2 Infrastructure Network



7.3 Material Network



7.4 Knowledge Network



8. Outputs

8.1 Structural Equivalence

PROFILE STRUCTURAL EQUIVALENCE

Measure: Euclidean Distance
 Include transpose YES
 Diagonal: Ignore
 Use geodesics? NO
 Input dataset: Sagunto general matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general matrix)

Structural Equivalence Matrix

	Cemen	Cemen	Metal	Metal	Metal	Chemi	Auto.	Auto.	Scrap	Regas	Exter	Exter
Cement 1	0.00	1.82	3.33	2.58	2.35	2.11	1.41	1.05	2.35	1.82	3.49	1.82
Cement 2	1.82	0.00	3.00	2.65	2.45	1.73	1.82	1.41	2.45	1.41	3.61	2.45
Metal 1	3.33	3.00	0.00	2.00	2.24	2.83	2.98	3.00	3.00	3.32	2.83	3.00
Metal 2	2.58	2.65	2.00	0.00	1.00	2.00	2.11	2.24	2.24	2.65	2.83	2.24
Metal 3	2.35	2.45	2.24	1.00	0.00	2.24	1.82	2.00	1.41	2.45	3.00	2.00
Chemical	2.11	1.73	2.83	2.00	2.24	0.00	1.49	1.73	2.24	1.73	2.83	2.24
Auto.Comp1	1.41	1.82	2.98	2.11	1.82	1.49	0.00	1.05	1.82	1.82	3.33	1.49
Auto.Comp2	1.05	1.41	3.00	2.24	2.00	1.73	1.05	0.00	2.00	1.41	3.32	2.00
ScrapDeal	2.35	2.45	3.00	2.24	1.41	2.24	1.82	2.00	0.00	2.00	3.00	2.00
Regasific.	1.82	1.41	3.32	2.65	2.45	1.73	1.82	1.41	2.00	0.00	3.32	2.00
ExternalRe	3.49	3.61	2.83	2.83	3.00	2.83	3.33	3.32	3.00	3.32	0.00	3.32
ExternalIn	1.82	2.45	3.00	2.24	2.00	2.24	1.49	2.00	2.00	2.00	3.32	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	1	1	1
1.000	3 1 6 7 1 8 2 0 4 5 9 2		
1.053	. . . . . XXX . .		
1.173	. . . XXXXX . . XXX . .		
1.414	. . . XXXXX XXX XXX . .		
1.619	. . . XXXXXXXXXXX XXX . .		
1.688	. . . XXXXXXXXXXX XXXXX . .		
1.744	. . XXXXXXXXXXXXXXX XXXXX . .		
2.031	. . XXXXXXXXXXXXXXX XXXXXXX		
2.125	. . XXXXXXXXXXXXXXXXXXXXXXX		
2.828	XXX XXXXXXXXXXXXXXXXXXXXXXX		
3.134	XXXXXXXXXXXXXXXXXXXXXXXXXXXX		

PROFILE STRUCTURAL EQUIVALENCE

```

-----
Measure:                               Euclidean Distance
Include transpose                       YES
Diagonal:                               Ignore
Use geodesics?                          NO
Input dataset:                          Sagunto infras matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto infras
matrix)

```

Structural Equivalence Matrix

	Cemen	Cemen	Metal	Metal	Metal	Chemi	Auto.	Auto.	Scrap	Regas	Exter	Exter
Cement 1	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
Cement 2	1.41	0.00	2.00	2.00	1.41	1.73	1.41	1.41	1.41	1.00	1.41	1.41
Metal 1	2.00	2.00	0.00	1.41	2.00	1.73	2.00	2.00	2.00	2.24	2.00	2.00
Metal 2	1.41	2.00	1.41	0.00	1.41	1.00	1.41	1.41	1.41	1.73	1.41	1.41
Metal 3	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
Chemical	1.73	1.73	1.73	1.00	1.73	0.00	1.73	1.73	1.73	1.41	1.73	1.73
Auto.Comp1	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
Auto.Comp2	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
Scrap	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
Regasific.	1.00	1.00	2.24	1.73	1.00	1.41	1.00	1.00	1.00	0.00	1.00	1.00
ExternalRe	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00
ExternalInd	0.00	1.41	2.00	1.41	0.00	1.73	0.00	0.00	0.00	1.00	0.00	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	3	4	6	2	0	5	1	8	9	7	1	2
0.000	XXXXXXXXXXXXXXXX						
1.000	.	XXX	XXX	XXXXXXXXXXXXXXXX								
1.138	.	XXX	XXXXXXXXXXXXXXXX									
1.625	.	XXXXXXXXXXXXXXXX										
1.967	XXXXXXXXXXXXXXXX											

```

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Sagunto\SEPart)

```

```

-----
Running time: 00:00:01
Output generated: 29 Jun 10 23:41:36
Copyright (c) 1999-2008 Analytic Technologies

```

PROFILE STRUCTURAL EQUIVALENCE

```

-----
Measure:                               Euclidean Distance
Include transpose                       YES
Diagonal:                               Ignore
Use geodesics?                          NO
Input dataset:                          Sagunto material matrix realised
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Sagunto\Sagunto material matrix realised)
    
```

Structural Equivalence Matrix

	Cemen	Cemen	Metal	Metal	Metal	Chemi	Auto.	Auto	Scrap	Regas	Exter	
Exter												
Cement 1	0.00	1.00	2.65	2.45	2.24	1.00	1.73	1.00	2.24	1.41	3.46	1.73
Cement 2	1.00	0.00	2.45	2.24	2.00	0.00	1.41	0.00	2.00	1.00	3.32	2.00
Metal 1	2.65	2.45	0.00	1.00	2.00	2.45	2.45	2.45	2.83	2.65	3.00	2.45
Metal 2	2.45	2.24	1.00	0.00	1.00	2.24	1.73	2.24	2.24	2.45	3.16	2.24
Metal 3	2.24	2.00	2.00	1.00	0.00	2.00	1.41	2.00	1.41	2.24	3.00	2.00
Chemical	1.00	0.00	2.45	2.24	2.00	0.00	1.41	0.00	2.00	1.00	3.32	2.00
Auto. Compl	1.73	1.41	2.45	1.73	1.41	1.41	0.00	1.41	1.41	1.73	3.00	2.00
Auto Comp2	1.00	0.00	2.45	2.24	2.00	0.00	1.41	0.00	2.00	1.00	3.32	2.00
Scrap deal	2.24	2.00	2.83	2.24	1.41	2.00	1.41	2.00	0.00	1.73	3.00	2.00
Regasification	1.41	1.00	2.65	2.45	2.24	1.00	1.73	1.00	1.73	0.00	3.46	1.73
External Recyclers	3.46	3.32	3.00	3.16	3.00	3.32	3.00	3.32	3.00	3.46	0.00	3.32
External industries	1.73	2.00	2.45	2.24	2.00	2.00	2.00	2.00	2.00	1.73	3.32	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

Level	1	3	4	5	7	9	1	2	6	8	0	2
0.000	XXXXX	.	.	.	.
1.000	.	XXX	.	.	.	.	.	XXXXXXXXX	.	.	.	.
1.083	.	XXX	.	.	.	.	.	XXXXXXXXXXX	.	.	.	.
1.333	.	XXXXX	.	.	.	.	.	XXXXXXXXXXX	.	.	.	.
1.414	.	XXXXX	XXX	.	.	.	.	XXXXXXXXXXX	.	.	.	.
1.760	.	XXXXXXXXXX	XXXXXXXXXX	.	.	.	.	XXXXXXXXXX	.	.	.	.
1.827	.	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	.	.	.	XXXXXXXXXX	.	.	.	.
2.010	.	XXXXXXXXXXXXXXXXXXXXXXXXXX	.	.	.	.	.	XXXXXXXXXXXXXXXXXXXXXXXXXX	.	.	.	.
3.252	.	XXXXXXXXXXXXXXXXXXXXXXXXXX	.	.	.	.	.	XXXXXXXXXXXXXXXXXXXXXXXXXX	.	.	.	.

```

Output actor-by-actor equivalence matrix saved as dataset SE
(C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\SE)
Output partition-by-actor indicator matrix saved as dataset SEPart
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Sagunto\SEPart)
    
```

Running time: 00:00:01

Output generated: 29 Jun 10 23:42:14
 Copyright (c) 1999-2008 Analytic Technologies
 PROFILE STRUCTURAL EQUIVALENCE

 Measure: Euclidean Distance
 Include transpose YES
 Diagonal: Ignore
 Use geodesics? NO
 Input dataset: Sagunto knowledge matrix (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto
 knowledge matrix)

Structural Equivalence Matrix

	Cemen	Cemen	Metal	Metal	Metal	Chemi	Auto.	Auto.	Scrap	Regas	Exter	Exter
Cement 1	0.00	2.45	2.00	2.00	1.73	2.45	2.00	2.00	2.00	2.00	1.73	1.41
Cement 2	2.45	0.00	2.00	1.41	1.73	0.00	1.41	1.41	1.41	1.41	1.73	2.00
Metal 1	2.00	2.00	0.00	1.41	1.00	2.00	1.41	1.41	1.41	1.41	1.00	1.41
Metal 2	2.00	1.41	1.41	0.00	1.00	1.41	0.00	0.00	0.00	0.00	1.00	1.41
Metal 3	1.73	1.73	1.00	1.00	0.00	1.73	1.00	1.00	1.00	1.00	1.41	1.73
Chemical	2.45	0.00	2.00	1.41	1.73	0.00	1.41	1.41	1.41	1.41	1.73	2.00
Auto. Comp1	2.00	1.41	1.41	0.00	1.00	1.41	0.00	0.00	0.00	0.00	1.00	1.41
Auto. Comp2	2.00	1.41	1.41	0.00	1.00	1.41	0.00	0.00	0.00	0.00	1.00	1.41
Scrap Dealers	2.00	1.41	1.41	0.00	1.00	1.41	0.00	0.00	0.00	0.00	1.00	1.41
Regasification	2.00	1.41	1.41	0.00	1.00	1.41	0.00	0.00	0.00	0.00	1.00	1.41
External Recyclers	1.73	1.73	1.00	1.00	1.41	1.73	1.00	1.00	1.00	1.00	0.00	1.00
External Industries	1.41	2.00	1.41	1.41	1.73	2.00	1.41	1.41	1.41	1.41	1.00	0.00

HIERARCHICAL CLUSTERING OF EQUIVALENCE MATRIX

```

                                1 1 1
Level  2 6 1 3 5 4 7 8 9 0 1 2
-----
0.000  XXX . . . XXXXXXXXXXXX . .
1.000  XXX . XXX XXXXXXXXXXXXXX .
1.188  XXX . XXX XXXXXXXXXXXXXXXX
1.436  XXX . XXXXXXXXXXXXXXXXXXXX
1.654  XXX XXXXXXXXXXXXXXXXXXXXXX
1.870  XXXXXXXXXXXXXXXXXXXXXXXX

```

Output actor-by-actor equivalence matrix saved as dataset SE
 (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\SE)
 Output partition-by-actor indicator matrix saved as dataset SEPart
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Sagunto\SEPart)

 Running time: 00:00:01
 Output generated: 29 Jun 10 23:41:08
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8.2 Centrality Measures

MULTIPLE CENTRALITY MEASURES

```

-----
Input dataset:           Sagunto general matrix2 (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general
matrix2)
Output dataset:         Sagunto general matrix2-cent (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general
matrix2-cent)
Treat data as:          Auto-detect
Type of scores to output: Normalized
  
```

Matrix Page 1 is directed? YES

Centrality Measures

Page 1

	OutDeg	Indeg	OutBonP	InBonPw	Out2Ste	In2Step	OutARD	InARD	Between
Cement 1	0.182	0.273	1.818	1.894	0.455	0.455	0.364	0.439	0.064
Cement 2	0.364	0.091	3.342	0.006	0.636	0.000	0.545	0.000	0.000
Metal 1	0.727	0.364	6.867	4.184	0.727	0.727	0.682	0.530	0.195
Metal 2	0.455	0.273	4.921	3.786	0.636	0.727	0.530	0.485	0.017
Metal 3	0.273	0.364	1.825	5.135	0.455	0.727	0.409	0.530	0.017
Chemical	0.273	0.273	4.260	1.503	0.636	0.364	0.439	0.417	0.011
Auto.Comp 1	0.273	0.182	2.468	1.496	0.545	0.364	0.424	0.371	0.011
Auto. Comp 2	0.273	0.091	2.056	0.006	0.545	0.000	0.455	0.000	0.000
Scrap Dealers	0.091	0.364	0.006	4.672	0.000	0.455	0.000	0.508	0.000
Regasification	0.091	0.182	0.006	0.013	0.000	0.091	0.000	0.091	0.000
External Recyclers	0.455	0.818	5.091	6.440	0.727	0.818	0.545	0.773	0.358
External Industries	0.182	0.364	0.656	3.794	0.182	0.818	0.295	0.545	0.053

Value of Beta was: 0.261871866477412

Running time: 00:00:01

Output generated: 29 Jun 10 23:16:27

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FREEMAN'S DEGREE CENTRALITY MEASURES:

```

-----
Diagonal valid?          NO
Model:                  SYMMETRIC
Input dataset:          Sagunto general matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general
matrix)
  
```

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
11	External Recyclers	9.000	81.818	0.214
3	Metal 1	7.000	63.636	0.167
4	Metal 2	4.000	36.364	0.095
5	Metal 3	4.000	36.364	0.095
6	Chemical	3.000	27.273	0.071
2	Cement 2	3.000	27.273	0.071
9	Scrap Dealers	3.000	27.273	0.071
12	External Industries	3.000	27.273	0.071
1	Cement 1	2.000	18.182	0.048
7	Auto.Comp 1	2.000	18.182	0.048
10	Regasification Plant	1.000	9.091	0.024
8	Auto. Comp 2	1.000	9.091	0.024

DESCRIPTIVE STATISTICS

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
1	Mean	3.500	31.818	0.083
2	Std Dev	2.255	20.497	0.054
3	Sum	42.000	381.818	1.000
4	Variance	5.083	420.110	0.003
5	SSQ	208.000	17190.084	0.118
6	MCSSQ	61.000	5041.323	0.035
7	Euc Norm	14.422	131.111	0.343
8	Minimum	1.000	9.091	0.024
9	Maximum	9.000	81.818	0.214

Network Centralization = 60.00%
Heterogeneity = 11.79%. Normalized = 3.77%

Actor-by-centrality matrix saved as dataset FreemanDegree

```

-----
Running time: 00:00:01
  
```

Output generated: 16 Feb 10 16:51:47
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FREEMAN'S DEGREE CENTRALITY MEASURES:

 Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Sagunto infras matrix (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto infras
 matrix)

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
2	Cement 2	2.000	18.182	0.250
3	Metal 1	2.000	18.182	0.250
6	Chemical	2.000	18.182	0.250
4	Metal 2	1.000	9.091	0.125
10	Regasification Plant	1.000	9.091	0.125
5	Metal 3	0.000	0.000	0.000
1	Cement 1	0.000	0.000	0.000
8	Auto. Comp2	0.000	0.000	0.000
9	Scrap Dealers	0.000	0.000	0.000
7	Auto. Comp1	0.000	0.000	0.000
11	External Recyclers	0.000	0.000	0.000
12	External industries	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
1	Mean	0.667	6.061	0.083
2	Std Dev	0.850	7.726	0.106
3	Sum	8.000	72.727	1.000
4	Variance	0.722	59.688	0.011
5	SSQ	14.000	1157.025	0.219
6	MCSSQ	8.667	716.253	0.135
7	Euc Norm	3.742	34.015	0.468
8	Minimum	0.000	0.000	0.000
9	Maximum	2.000	18.182	0.250

Network Centralization = 14.55%
 Heterogeneity = 21.88%. Normalized = 14.77%

Actor-by-centrality matrix saved as dataset FreemanDegree

 Running time: 00:00:01

Output generated: 16 Feb 10 17:00:52
 Copyright (c) 2002-9 Analytic Technologies
 FREEMAN'S DEGREE CENTRALITY MEASURES:

 Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Sagunto material matrix realised
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Sagunto\Sagunto material matrix realised)

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
11	External Recyclers	9.000	81.818	0.237
3	Metal 1	6.000	54.545	0.158
4	Metal 2	5.000	45.455	0.132
5	Metal 3	4.000	36.364	0.105
7	Auto. Compl	3.000	27.273	0.079
12	External industries	3.000	27.273	0.079
9	Scrap dealers	3.000	27.273	0.079
1	Cement 1	2.000	18.182	0.053
2	Cement 2	1.000	9.091	0.026
8	Auto Comp2	1.000	9.091	0.026
6	Chemical	1.000	9.091	0.026
10	Regasification	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
1	Mean	3.167	28.788	0.083
2	Std Dev	2.444	22.216	0.064
3	Sum	38.000	345.455	1.000
4	Variance	5.972	493.572	0.004
5	SSQ	192.000	15867.769	0.133
6	MCSSQ	71.667	5922.865	0.050
7	Euc Norm	13.856	125.967	0.365
8	Minimum	0.000	0.000	0.000
9	Maximum	9.000	81.818	0.237

Network Centralization = 63.64%
 Heterogeneity = 13.30%. Normalized = 5.41%

Actor-by-centrality matrix saved as dataset FreemanDegree

 Running time: 00:00:01

Output generated: 16 Feb 10 16:58:06
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FREEMAN'S DEGREE CENTRALITY MEASURES:

 Diagonal valid? NO
 Model: SYMMETRIC
 Input dataset: Sagunto knowledge matrix (C:\Program
 Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto
 knowledge matrix)

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
1	Cement 1	3.000	27.273	0.300
3	Metal 1	2.000	18.182	0.200
2	Cement 2	1.000	9.091	0.100
5	Metal 3	1.000	9.091	0.100
6	Chemical	1.000	9.091	0.100
11	External Recyclers	1.000	9.091	0.100
12	External Industries	1.000	9.091	0.100
4	Metal 2	0.000	0.000	0.000
7	Auto. Compl	0.000	0.000	0.000
10	Regasification	0.000	0.000	0.000
8	Auto. Comp2	0.000	0.000	0.000
9	Scrap Dealers	0.000	0.000	0.000

DESCRIPTIVE STATISTICS

		1	2	3
		Degree	NrmDegree	Share
		-----	-----	-----
1	Mean	0.833	7.576	0.083
2	Std Dev	0.898	8.159	0.090
3	Sum	10.000	90.909	1.000
4	Variance	0.806	66.575	0.008
5	SSQ	18.000	1487.603	0.180
6	MCSSQ	9.667	798.898	0.097
7	Euc Norm	4.243	38.569	0.424
8	Minimum	0.000	0.000	0.000
9	Maximum	3.000	27.273	0.300

Network Centralization = 23.64%
 Heterogeneity = 18.00%. Normalized = 10.55%
 Actor-by-centrality matrix saved as dataset FreemanDegree

 Running time: 00:00:01

Output generated: 16 Feb 10 17:02:04
 Copyright (c) 2002-9 Analytic Technologies
 FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Sagunto general matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 429.000

		1	2
		Betweenness	nBetweenness
		-----	-----
11	External Recyclers	42.750	38.864
3	Metal 1	21.167	19.242
12	External Industries	8.000	7.273
1	Cement 1	7.000	6.364
4	Metal 2	1.917	1.742
5	Metal 3	1.917	1.742
6	Chemical	1.250	1.136
7	Auto.Comp 1	0.000	0.000
2	Cement 2	0.000	0.000
10	Regasification Plant	0.000	0.000
8	Auto. Comp 2	0.000	0.000
9	Scrap Dealers	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	7.000	6.364
2	Std Dev	12.280	11.163
3	Sum	84.000	76.364
4	Variance	150.792	124.621
5	SSQ	2397.500	1981.405
6	MCSSQ	1809.500	1495.454
7	Euc Norm	48.964	44.513
8	Minimum	0.000	0.000
9	Maximum	42.750	38.864

Network Centralization Index = 35.45%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 16 Feb 10 17:03:28

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Sagunto infras matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto infras matrix)

Important note: this routine binarizes but does NOT symmetrize.
 Un-normalized centralization: 31.000

		1	2
		Betweenness	nBetweenness
		-----	-----
3	Metal 1	3.000	2.727
6	Chemical	2.000	1.818
1	Cement 1	0.000	0.000
2	Cement 2	0.000	0.000
4	Metal 2	0.000	0.000
5	Metal 3	0.000	0.000
7	Auto. Comp1	0.000	0.000
8	Auto. Comp2	0.000	0.000
9	Scrap Dealers	0.000	0.000
10	Regasification Plant	0.000	0.000
11	External Recyclers	0.000	0.000
12	External industries	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	0.417	0.379
2	Std Dev	0.954	0.867
3	Sum	5.000	4.545
4	Variance	0.910	0.752
5	SSQ	13.000	10.744
6	MCSSQ	10.917	9.022
7	Euc Norm	3.606	3.278
8	Minimum	0.000	0.000
9	Maximum	3.000	2.727

Network Centralization Index = 2.56%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 19 Feb 10 13:36:56
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FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Sagunto material matrix realised
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Sagunto\Sagunto material matrix realised)

Important note: this routine binarizes but does NOT symmetrize.
 Un-normalized centralization: 478.000

		1	2
		Betweenness	nBetweenness
		-----	-----
11	External Recyclers	46.000	41.818
12	External industries	8.000	7.273
1	Cement 1	6.000	5.455
4	Metal 2	5.833	5.303
3	Metal 1	5.833	5.303
5	Metal 3	2.333	2.121
7	Auto. Compl	0.000	0.000
2	Cement 2	0.000	0.000
9	Scrap dealers	0.000	0.000
10	Regasification	0.000	0.000
8	Auto Comp2	0.000	0.000
6	Chemical	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	6.167	5.606
2	Std Dev	12.360	11.236
3	Sum	74.000	67.273
4	Variance	152.764	126.251
5	SSQ	2289.500	1892.149
6	MCSSQ	1833.167	1515.014
7	Euc Norm	47.849	43.499
8	Minimum	0.000	0.000
9	Maximum	46.000	41.818

Network Centralization Index = 39.50%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 19 Feb 10 13:35:11

FREEMAN BETWEENNESS CENTRALITY

 Input dataset: Sagunto knowledge matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto knowledge matrix)

Important note: this routine binarizes but does NOT symmetrize.

Un-normalized centralization: 22.000

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Cement 1	2.000	1.818
2	Cement 2	0.000	0.000
3	Metal 1	0.000	0.000
4	Metal 2	0.000	0.000
5	Metal 3	0.000	0.000
6	Chemical	0.000	0.000
7	Auto. Comp1	0.000	0.000
8	Auto. Comp2	0.000	0.000
9	Scrap Dealers	0.000	0.000
10	Regasification	0.000	0.000
11	External Recyclers	0.000	0.000
12	External Industries	0.000	0.000

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1	2
		Betweenness	nBetweenness
		-----	-----
1	Mean	0.167	0.152
2	Std Dev	0.553	0.503
3	Sum	2.000	1.818
4	Variance	0.306	0.253
5	SSQ	4.000	3.306
6	MCSSQ	3.667	3.030
7	Euc Norm	2.000	1.818
8	Minimum	0.000	0.000
9	Maximum	2.000	1.818

Network Centralization Index = 1.82%

Output actor-by-centrality measure matrix saved as dataset
 FreemanBetweenness

 Running time: 00:00:01
 Output generated: 19 Feb 10 13:37:51

CLOSENESS CENTRALITY

 Input dataset: Sagunto general matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general matrix)
 Method: Geodesic paths only (Freeman Closeness)
 Output dataset: Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)
 Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.

The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.
 Closeness Centrality Measures

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
11	External Recyclers	34.000	48.000	32.353	22.917
9	Scrap Dealers	35.000	132.000	31.429	8.333
5	Metal 3	40.000	53.000	27.500	20.755
12	External Industries	40.000	60.000	27.500	18.333
3	Metal 1	40.000	45.000	27.500	24.444
4	Metal 2	41.000	49.000	26.829	22.449
6	Chemical	46.000	51.000	23.913	21.569
1	Cement 1	47.000	54.000	23.404	20.370
7	Auto.Comp 1	47.000	54.000	23.404	20.370
10	Regasification Plant	121.000	132.000	9.091	8.333
2	Cement 2	132.000	32.000	8.333	34.375
8	Auto. Comp 2	132.000	45.000	8.333	24.444

Statistics

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
1	Mean	62.917	62.917	22.466	20.558
2	Std Dev	38.060	31.579	8.443	6.678
3	Sum	755.000	755.000	269.590	246.694
4	Variance	1448.576	997.243	71.279	44.602
5	SSQ	64885.000	59469.000	6911.913	5606.701
6	MCSSQ	17382.916	11966.917	855.353	535.222
7	Euc Norm	254.725	243.863	83.138	74.878
8	Minimum	34.000	32.000	8.333	8.333
9	Maximum	132.000	132.000	32.353	34.375

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

 Running time: 00:00:01

Output generated: 19 Feb 10 13:39:14
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 CLOSENESS CENTRALITY

 Input dataset: Sagunto infras matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto infras matrix)
 Method: Geodesic paths only (Freeman Closeness)
 Output dataset: Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.
 The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
3	Metal 1	100.000	110.000	11.000	10.000
6	Chemical	100.000	111.000	11.000	9.910
4	Metal 2	102.000	111.000	10.784	9.910
10	Regasification Plant	121.000	132.000	9.091	8.333
2	Cement 2	132.000	91.000	8.333	12.088
5	Metal 3	132.000	132.000	8.333	8.333
1	Cement 1	132.000	132.000	8.333	8.333
8	Auto. Comp2	132.000	132.000	8.333	8.333
9	Scrap Dealers	132.000	132.000	8.333	8.333
7	Auto. Compl	132.000	132.000	8.333	8.333
11	External Recyclers	132.000	132.000	8.333	8.333
12	External industries	132.000	132.000	8.333	8.333

Statistics

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
1	Mean	123.250	123.250	9.045	9.048
2	Std Dev	13.386	13.317	1.108	1.145
3	Sum	1479.000	1479.000	108.542	108.574
4	Variance	179.188	177.354	1.227	1.310
5	SSQ	184437.000	184415.000	996.502	998.086
6	MCSSQ	2150.250	2128.250	14.723	15.719
7	Euc Norm	429.461	429.436	31.567	31.592
8	Minimum	100.000	91.000	8.333	8.333
9	Maximum	132.000	132.000	11.000	12.088

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness
 (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

 Running time: 00:00:01

Output generated: 19 Feb 10 13:49:05
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 CLOSENESS CENTRALITY

 Input dataset: Sagunto material matrix realised
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Sagunto\Sagunto material matrix realised)
 Method: Geodesic paths only (Freeman Closeness)
 Output dataset: Closeness (C:\Program Files\Analytic
 Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.
 The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
11	External Recyclers	34.000	58.000	32.353	18.966
9	Scrap dealers	36.000	132.000	30.556	8.333
5	Metal 3	40.000	62.000	27.500	17.742
12	External industries	40.000	68.000	27.500	16.176
4	Metal 2	41.000	59.000	26.829	18.644
3	Metal 1	42.000	56.000	26.190	19.643
1	Cement 1	47.000	63.000	23.404	17.460
7	Auto. Compl	47.000	63.000	23.404	17.460
2	Cement 2	132.000	54.000	8.333	20.370
10	Regasification	132.000	132.000	8.333	8.333
8	Auto Comp2	132.000	54.000	8.333	20.370
6	Chemical	132.000	54.000	8.333	20.370

Statistics

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
1	Mean	71.250	71.250	20.923	16.989
2	Std Dev	43.101	27.484	9.215	4.077
3	Sum	855.000	855.000	251.070	203.869
4	Variance	1857.688	755.354	84.907	16.625
5	SSQ	83211.000	69983.000	6271.901	3663.059
6	MCSSQ	22292.250	9064.250	1018.886	199.502
7	Euc Norm	288.463	264.543	79.195	60.523
8	Minimum	34.000	54.000	8.333	8.333
9	Maximum	132.000	132.000	32.353	20.370

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness
 (C:\Program Files\Analytic Technologies\Ucinet
 6\DataFiles\Sagunto\Closeness)

 Running time: 00:00:01

Output generated: 19 Feb 10 13:48:01
 Copyright (c) 1999-2008 Analytic Technologies
 CLOSENESS CENTRALITY

 Input dataset: Sagunto knowledge matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto knowledge matrix)
 Method: Geodesic paths only (Freeman Closeness)
 Output dataset: Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

Note: Data not symmetric, therefore separate in-closeness & out-closeness computed.
 The network is not connected. Technically, closeness centrality cannot be computed, as there are infinite distances.

Closeness Centrality Measures

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
1	Cement 1	99.000	121.000	11.111	9.091
12	External Industries	101.000	121.000	10.891	9.091
2	Cement 2	121.000	121.000	9.091	9.091
5	Metal 3	121.000	132.000	9.091	8.333
6	Chemical	121.000	121.000	9.091	9.091
4	Metal 2	132.000	132.000	8.333	8.333
7	Auto. Comp1	132.000	132.000	8.333	8.333
8	Auto. Comp2	132.000	132.000	8.333	8.333
3	Metal 1	132.000	100.000	8.333	11.000
10	Regasification	132.000	132.000	8.333	8.333
11	External Recyclers	132.000	111.000	8.333	9.910
9	Scrap Dealers	132.000	132.000	8.333	8.333

Statistics

		1	2	3	4
		inFarness	outFarness	inCloseness	outCloseness
1	Mean	123.917	123.917	8.967	8.939
2	Std Dev	11.651	9.853	0.964	0.790
3	Sum	1487.000	1487.000	107.608	107.274
4	Variance	135.743	97.076	0.930	0.624
5	SSQ	185893.000	185429.000	976.118	966.451
6	MCSSQ	1628.917	1164.917	11.156	7.484
7	Euc Norm	431.153	430.615	31.243	31.088
8	Minimum	99.000	100.000	8.333	8.333
9	Maximum	132.000	132.000	11.111	11.000

Network centralization not computed for unconnected graphs
 Output actor-by-centrality measure matrix saved as dataset Closeness (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Closeness)

 Running time: 00:00:01

Output generated: 19 Feb 10 13:51:16
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8.3 Core-Periphery Structure

SIMPLE CORE/PERIPHERY MODEL

```
-----
-----
Input dataset:           Sagunto general matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto general
matrix)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CoreClasses)
Starting fitness: 0.089
Final fitness: 0.089
```

Core/Periphery Class Memberships:

```
1: Cement 1 Cement 2 Metal 1 Metal 2 Metal 3 Chemical Auto. Comp
1 Scrap Dealers External Recyclers External Industries
2: Auto. Comp 2 Regasification Plant
```

Blocked Adjacency Matrix

								1	1	1		
	1	2	3	4	5	6	7	1	9	2	0	8
	C	C	M	M	M	C	A	E	S	E	R	A
1	Cement 1							1				
2	Cement 2					1		1			1	
3	Metal 1			1	1	1	1	1	1	1		
4	Metal 2			1	1			1	1			
5	Metal 3							1	1			
6	Chemical			1				1				
7	Auto.Comp 1							1				
11	External Recyclers			1	1	1				1		
9	Scrap Dealers											
12	External Industries			1								
10	Regasification Plant											
8	Auto. Comp 2							1				

Density matrix

	1	2
1	0.267	0.050
2	0.050	0.000

Partition saved as dataset CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)
SIMPLE CORE/PERIPHERY MODEL

Input dataset: Sagunto infras matrix (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto infras matrix)
Type of data: Positive
Fitness measure: CORR
Density of core-to-periphery ties:
Number of iterations: 50
Population size: 100
Output partition: CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)
Output clusters: CoreClasses (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CoreClasses)
Starting fitness: 0.226
Final fitness: 0.226
Core/Periphery Class Memberships:
1: Cement 1 Cement 2 Metal 1 Metal 2 Metal 3 Chemical
Regasification Plant
2: Auto. Comp 1 Auto. Comp 2 Scrap Dealers External Recyclers
External industries
Blocked Adjacency Matrix

		1	2	3	4	5	6	0	8	9	7	1	2
		C	C	M	M	M	C	R	A	S	A	E	E
1	Cement 1												
2	Cement 2					1	1						
3	Metal 1			1	1								
4	Metal 2		1										
5	Metal 3												
6	Chemical		1										
10	Regasification Plant												
8	Auto. Comp2												
9	Scrap Dealers												
7	Auto. Compl												
11	External Recyclers												
12	External industries												

Density matrix

	1	2
1	0.143	0.000
2	0.000	0.000

Partition saved as dataset CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Sagunto material matrix realised
(C:\Program Files\Analytic Technologies\Ucinet
6\DataFiles\Sagunto\Sagunto material matrix realised)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CoreClasses)
Starting fitness: 0.170
Final fitness: 0.170
Core/Periphery Class Memberships:
  1: Cement 1 Cement 2 Metal 1 Metal 2 Metal 3 Auto. Comp 1 Scrap
Dealers External Recyclers External industries
  2: Chemical Auto. Comp 2 Regasification Plant

```

Blocked Adjacency Matrix

		1	1	1														
		1	2	3	4	5	2	7	1	9	0	8	6					
		C	C	M	M	M	E	A	E	S	R	A	C					
1	Cement 1								1									
2	Cement 2								1									
3	Metal 1				1	1	1	1	1	1								
4	Metal 2					1		1	1	1								
5	Metal 3								1	1								
12	External industries	1																
7	Auto. Compl								1									
11	External Recyclers			1	1	1	1											
9	Scrap dealers																	
10	Regasification																	
8	Auto Comp2									1								
6	Chemical									1								

Density matrix

	1	2
1	0.278	0.000
2	0.074	0.000

Partition saved as dataset CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)

SIMPLE CORE/PERIPHERY MODEL

```

-----
Input dataset:           Sagunto knowledge matrix (C:\Program
Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\Sagunto
knowledge matrix)
Type of data:           Positive
Fitness measure:        CORR
Density of core-to-periphery ties:
Number of iterations:   50
Population size:        100
Output partition:       CorePartition (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)
Output clusters:        CoreClasses (C:\Program Files\Analytic
Technologies\Ucinet 6\DataFiles\Sagunto\CoreClasses)
Starting fitness: 0.157
Final fitness: 0.157
Core/Periphery Class Memberships:
  1: Cement 1 Cement 2 Metal 1 Metal 2 Metal 3 Chemical External
Recyclers External industries
  2: Auto. Comp 1 Auto. Comp 2 Scrap Dealers Regasification Plant

```

Blocked Adjacency Matrix

							1	1		1			
	1	2	3	4	5	6	1	2	7	0	8	9	
	C	C	M	M	M	C	E	E	A	R	A	S	
1	Cement 1							1					
2	Cement 2						1						
3	Metal 1	1											
4	Metal 2			1									
5	Metal 3												
6	Chemical		1										
11	External Recyclers	1											
12	External Industries	1											
7	Auto. Comp1												
10	Regasification												
8	Auto. Comp2												
9	Scrap Dealers												

Density matrix

	1	2
1	0.125	0.000
2	0.000	0.000

Partition saved as dataset CorePartition (C:\Program Files\Analytic Technologies\Ucinet 6\DataFiles\Sagunto\CorePartition)

Appendix D

NISP: Analysis outputs

1. Hermeneutic Unit- All Objects

HU: NISP
File: [R:\PHD\NISP\NISP.hpr5]
Edited by: Super
Date/Time: 10/05/2010 17:17:05

List of all objects

HUs
===

NISP

Primary Docs
=====

P 4: BF.doc
P 5: COR.doc
P 6: Interviewee NISP NORTH WEST.doc
P 7: COA.doc
P 8: Interviewnispwales.doc
P 9: NISP LONDON.doc
P10: NISP WEST MIDLANDS.doc
P11: NORTHERN IRELAND PROGRAMME.doc
P12: SISP.doc
P13: SW NISP.doc
P14: Yorkshire and Humber Region transcript.doc

Quotations
=====

4:1 Mapping closer resources to th.. (2:2)
4:2 Change of the landfill tax (5:5)
4:3 Study of material flows in dif.. (3:3)
4:4 NISP find materials that can b.. (6:6)
4:5 Pushing the case for resource .. (7:7)
4:6 We also want to idenfy outlets.. (8:8)
4:7 The key problem in UK is that .. (10:10)
4:8 I didn't encounter any other b.. (11:11)
4:9 Some of these initiatives stop.. (11:11)
4:10 Usually it is not companies th.. (12:12)
4:11 Even those companies that have.. (13:13)
4:12 Waste management companies hav.. (14:14)
4:13 We have developed an intellige.. (15:15)
4:14 Sometimes it requires lateral .. (17:17)
4:15 KTN is a combination of academ.. (18:18)
4:16 We should have a database onli.. (21:21)
4:17 There is economic flow informa.. (22:22)

4:18 Policy commitment to create an.. (24:24)
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Codes

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Access to companies {1-0}
 Advantages of NISP {1-0}
 Attitude companies towards the programme {1-0}
 Attraction of members {2-0}
 Barrier- Responsibility {1-0}
 Barrier_ Landfill tax too low {5-0}
 Barriers-Transportation costs {2-0}
 Barriers_ communication {1-0}

Benefits of collaborating with NISP {2-0}
 Big companies have large volumes of waste of a more consistent nature {2-0}
 Big companies that help us to achieve our targets {4-0}
 Building relations {2-0}
 Calculations of the outcomes generated by the programme {3-0}
 Challenges_ changes in regional teams {2-0}
 Challenges_ discontinuous funding of the programme {1-0}
 Change in the conception of waste as a resource {1-0}
 Change of strategy depending on contact person {1-0}
 Channels of communication {1-0}
 Cleaning up of materials prior IS exchange {1-0}
 Collaboration with NISP has also help the company to find new IS opportunities on its own {1-0}
 Communication- NISP as intermediary {2-0}
 complementarity between KTN and NISP {1-0}
 Concept of waste {2-0}
 Conditions for IS exchanges {1-0}
 Confidentiality {4-0}
 Cooperation in one project bring out more opportunities of cooperation {1-0}
 Core members {1-0}
 Cost-effectiveness of NISP {1-0}
 Cross sectional synergies the focus of NISP {3-0}
 Cultural barriers-conception of waste {1-0}
 Database matches need to be reviewed by practitioner {1-0}
 Day to day work with the companies {3-0}
 Definition of regional targets {1-0}
 Difficult to attract companies in regions where NISP is not known {2-0}
 Discourse focuses on potential economic gains {1-0}
 Drivers for environmental management improvements {1-0}
 Economic and environmental benefits of IS exchanges {1-0}
 Emphasize economic savings and incentives {1-0}
 Environment was regarded as a cost {1-0}
 Evolving towards more complex projects involving a number of actors/companies {3-0}
 Failure of potential IS exchanges {1-0}
 Failure of potential IS opportunities {1-0}
 Focus on big companies {2-0}
 Following up IS exchanges {3-0}
 Formalisation of IS exchanges in commercial contracts {1-0}
 Frequent regional team changes {2-0}
 Funding of NISP {1-0}
 further recycling is technologically possible but not economically feasible at the moment {1-0}
 Future trends {1-0}
 Identifying IS opportunities is time consuming {1-0}
 Impact of regional team changes on the relationship with members {3-0}
 Importance of communication {2-0}
 Interaction with other programmes {1-0}
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 Introduce changes in structure of relative prices {1-0}

Involvement of NISP practitioners {1-0}
IS benefits {1-0}
IS exchanges are driven by economics {6-0}
IS exchanges improve bottom line {2-0}
IS exchanges need to be economically viable {1-0}
IS learning {2-0}
IS opportunities {1-0}
IS synergies require a lot of time to materialise {5-0}
It fosters communication among companies {1-0}
It is free of charge {9-0}
It is simple {3-0}
Key success factors {2-0}
Knowledge transfer {2-0}
Lack of information to plan resource economy {1-0}
Landfill tax {2-0}
Landfilling won't be an option in 10 years {1-0}
lateral thinking in finding new uses for resources- NISP may help with this {2-0}
Learning across different regional programmes {7-0}
Lessons learnt- from waste to resource {1-0}
Lessons learnt- Hierarchy of waste management options {1-0}
Limitations {1-0}
Limitations of CRISP {1-0}
Main areas of IS exchanges {1-0}
Market failure {3-0}
Material flows {1-0}
Member companies with a high environmental profile {1-0}
Monitoring and follow-up of synergies {1-0}
Most matches fail to materialise as IS exchanges {1-0}
Need to address the key person in the company {1-0}
Need to be sure that companies report all IS opportunities created by NISP {2-0}
Need to have a basic understanding of the companies' needs {1-0}
Negotiation of the commercial agreement as a common cause of failure of IS exchanges {3-0}
Network of recycling opportunities is developed {1-0}
NISP an option to find cheaper outlets for waste materials {1-0}
NISP and technological development and innovation {1-0}
NISP as a resource_not waste_ programme {1-0}
NISP Database {7-0}
NISP facilitator in identifying IS opportunities {4-0}
NISP focus on large volumes {1-0}
NISP networks_contacts to make IS possible {1-0}
NISP relation with environmental agency and other support programmes {1-0}
NISP should cooperate with other supporting programmes {1-0}
NISP strategy {1-0}
NISP was interested because of the large volumes generated {1-0}
Once companies are brought together, NISP should step backwards {3-0}
Outcomes of the workshop {2-0}
PAG's role {4-0}
People generally is prepared to talk {1-0}
Phases on IS development {1-0}

Pilot project in the mersey back {1-0}
 Point to the environmental benefits {1-0}
 Policy commitment to create an.. {1-0}
 Pragmatical approach-the use of case studies and success stories {1-0}
 Preexisting networks {0-0}
 Problem_ downsizing of companies and lack of tecnical expertise {1-0}
 Process of building the methodology {0-0}
 Quick win workshop {10-0}
 reaction of the companies to the programme {2-0}
 Reasons to contact NISP {2-0}
 Recruitment strategy {4-0}
 Recycling infrastructures {1-0}
 Regulation as driver {1-0}
 Regulation as driver of environmental management improvements {1-0}
 Regulatory barriers_ resources classified as waste {7-0}
 Regulatory bodies are inflexible {1-0}
 Relation with NISP require to devote a lot of time {1-0}
 Relationship with regulators {1-0}
 relevance of environmental issues in the company {1-0}
 Reputation_key in attracting members {2-0}
 Resource economy {3-0}
 Short mental distance {1-0}
 Small volumes of waste are generally not viable as IS exchanges {1-0}
 Solution providers {3-0}
 Start of the programme {0-0}
 Strategy designing {3-0}
 Structure of NISP as key success factor {2-0}
 Structure of the regional programme {1-0}
 Study material flows for technology change {2-0}
 Synergies not accounted for {0-0}
 Talk to regulatory bodies to grant exceptions or introduce changes in regulation {1-0}
 Technological barriers_ cost of investment {4-0}
 Technological barriers_ Specifications of the materials {2-0}
 The evolution of NISP {2-0}
 The hidden cost of waste {1-0}
 The origins of NISP {2-0}
 The relationship between company-member and NISP {1-0}
 The role of EMSs {1-0}
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 The role of NISP in removing barriers to IS exchanges {1-0}
 The role of NISP in the resource economy {1-0}
 The role of waste managers in IS {1-0}
 There are other support programmes more suitable for small companies {1-0}
 There is not enough incentives yet to make IS exchanges viable {1-0}
 Transition team {1-0}
 Waste maanger sector- Role in finding best environmental solutions to waste materials {1-0}
 waste need to be segregated to be suitable to be exchanged {1-0}
 We don't have time {1-0}
 Working concept of IS {1-0}
 Workshop main tool to recruit companies {1-0}

Workshop methodology {1-0}
Workshops {0-0}

2. List of Codes

Code-Filter: All

HU: NISP
File: [R:\PHD\NISP\NISP.hpr5]
Edited by: Super
Date/Time: 10/05/2010 16:27:45

Access to companies
Advantages of NISP
Attitude companies towards the programme
Attraction of members
Barrier- Responsibility
Barrier_ Landfill tax too low
Barriers-Transportation costs
Barriers_ communication
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Big companies that help us to achieve our targets
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Calculations of the outcomes generated by the programme
Challenges_ changes in regional teams
Challenges_ discontinuous funding of the programme
Change in the conception of waste as a resource
Change of strategy depending on contact person
Channels of communication
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Collaboration with NISP has also help the company to find new IS opportunities on its own
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complementarity between KTN and NISP
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Confidentiality
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Cultural barriers-conception of waste
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Environment was regarded as a cost
Evolving towards more complex projects involving a number of actors/companies
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Failure of potential IS opportunities
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Following up IS exchanges
Formalisation of IS exchanges in commercial contracts
Frequent regional team changes
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Future trends
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Interaction with the company
Introduce changes in structure of relative prices
Involvement of NISP practitioners
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IS exchanges improve bottom line
IS exchanges need to be economically viable
IS learning
IS opportunities
IS synergies require a lot of time to materialise
It fosters communication among companies
It is free of charge
It is simple
Key success factors
Knowledge transfer
Lack of information to plan resource economy
Landfill tax
Landfilling won't be an option in 10 years
lateral thinking in finding new uses for resources- NISP may help with this
Learning across different regional programmes
Lessons learnt- from waste to resource
Lessons learnt- Hierarchy of waste management options
Limitations
Limitations of CRISP
Main areas of IS exchanges
Market failure
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Member companies with a high environmental profile
Monitoring and follow-up of synergies
Most matches fail to materialise as IS exchanges
Need to address the key person in the company
Need to be sure that companies report all IS opportunities created by NISP

Need to have a basic understanding of the companies' needs
 Negotiation of the commercial agreement as a common cause of failure of IS exchanges
 Network of recycling opportunities is developed
 NISP an option to find cheaper outlets for waste materials
 NISP and technological development and innovation
 NISP as a resource_not waste_ programme
 NISP Database
 NISP facilitator in identifying IS opportunities
 NISP focus on large volumes
 NISP networks_ contacts to make IS possible
 NISP relation with environmental agency and other support programmes
 NISP should cooperate with other supporting programmes
 NISP strategy
 NISP was interested because of the large volumes generated
 Once companies are brought together, NISP should step backwards
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 People generally is prepared to talk
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 Profile of the companies
 Profile of the member companies
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 Regulation as driver of environmental management improvements
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Transition team
Waste manager sector- Role in finding best environmental solutions to waste materials
waste need to be segregated to be suitable to be exchanged
We don't have time
Working concept of IS
Workshop main tool to recruit companies
Workshop methodology
Workshops

3. Code Neighbours

HU: NISP

File: [R:\PHD\NISP\NISP.hpr5]

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Code neighbors list
Code-Filter: All [156]

Access to companies

Advantages of NISP

Attitude companies towards the programme

Attraction of members

Barrier- Responsibility

Barrier_ Landfill tax too low

Barriers-Transportation costs

Barriers_ communication

Benefits of collaborating with NISP

Big companies have large volumes of waste of a more consistent nature

Big companies that help us to achieve our targets

Building relations

Calculations of the outcomes generated by the programme

Challenges_ changes in regional teams

Challenges_ discontinuous funding of the programme

Change in the conception of waste as a resource

Change of strategy depending on contact person

Channels of communication

Cleaning up of materials prior IS exchange

Collaboration with NISP has also help the company to find new IS opportunities on its own

Communication- NISP as intermediary

complementarity between KTN and NISP

Concept of waste

Conditions for IS exchanges

Confidentiality

Cooperation in one project bring out more opportunities of cooperation

Core members

Cost-effectiveness of NISP

Cross sectional synergies the focus of NISP

Cultural barriers-conception of waste

Database matches need to be reviewed by practitioner

Day to day work with the companies

Definition of regional targets

Difficult to attract companies in regions where NISP is not known

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Emphasize economic savings and incentives

Environment was regarded as a cost

Evolving towards more complex projects involving a number of actors/companies

Failure of potential IS exchanges

Failure of potential IS opportunities

Focus on big companies

Following up IS exchanges

Formalisation of IS exchanges in commercial contracts

Frequent regional team changes

Funding of NISP

further recycling is technologically possible but not economically feasible at the moment

Future trends

Identifying IS opportunities is time consuming

Impact of regional team changes on the relationship with members

Importance of communication

Interaction with other programmes

Interaction with the company

Introduce changes in structure of relative prices

Involvement of NISP practitioners

IS benefits

IS exchanges are driven by economics

IS exchanges improve bottom line

IS exchanges need to be economically viable

IS learning

IS opportunities

IS synergies require a lot of time to materialise

It fosters communication among companies

It is free of charge

It is simple

Key success factors

Knowledge transfer

Lack of information to plan resource economy

Landfill tax

Landfilling won't be an option in 10 years

lateral thinking in finding new uses for resources- NISP may help with this

Learning across different regional programmes

Lessons learnt- from waste to resource

Lessons learnt- Hierarchy of waste management options

Limitations

Limitations of CRISP

Main areas of IS exchanges

Market failure

Material flows

Member companies with a high environmental profile

Monitoring and follow-up of synergies

Most matches fail to materialise as IS exchanges

Need to address the key person in the company

Need to be sure that companies report all IS opportunities created by NISP

Need to have a basic understanding of the companies' needs

Negotiation of the commercial agreement as a common cause of failure of IS exchanges

Network of recycling opportunities is developed

NISP an option to find cheaper outlets for waste materials

NISP and technological development and innovation

NISP as a resource_not waste_ programme

NISP Database

NISP facilitator in identifying IS opportunities

NISP focus on large volumes

NISP networks_ contacts to make IS possible

NISP relation with environmental agency and other support programmes

NISP should cooperate with other supporting programmes

NISP strategy

NISP was interested because of the large volumes generated
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People generally is prepared to talk
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Point to the environmental benefits
Policy commitment to create an..
Pragmatical approach-the use of case studies and success stories
Preexisting networks
Problem_ downsizing of companies and lack of technical expertise
Process of building the methodology
Quick win workshop
reaction of the companies to the programme
Reasons to contact NISP
Recruitment strategy
Recycling infrastructures
Regulation as driver
Regulation as driver of environmental management improvements
Regulatory barriers_ resources classified as waste
Regulatory bodies are inflexible
Relation with NISP require to devote a lot of time
Relationship with regulators
relevance of environmental issues in the company
Reputation_key in attracting members

Resource economy

Short mental distance

Small volumes of waste are generally not viable as IS exchanges

Solution providers

Start of the programme

Strategy designing

Structure of NISP as key success factor

Structure of the regional programme

Study material flows for technology change

Synergies not accounted for

Talk to regulatory bodies to grant exceptions or introduce changes in regulation

Technological barriers_ cost of investment

Technological barriers_ Specifications of the materials

The evolution of NISP

The hidden cost of waste

The origins of NISP

The relationship between company-member and NISP

The role of EMSs

The role of geographical distance

The role of NISP in removing barriers to IS exchanges

The role of NISP in the resource economy

The role of waste managers in IS

There are other support programmes more suitable for small companies

There is not enough incentives yet to make IS exchanges viable

Transition team

Waste manager sector- Role in finding best environmental solutions to waste materials

waste need to be segregated to be suitable to be exchanged

We don't have time

Working concept of IS

Workshop main tool to recruit companies

Workshop methodology

Workshops

4. Code Hierarchy

Codes hierarchy

Code-Filter: All

HU: NISP
File: [R:\PHD\NISP\NISP.hpr5]
Edited by: Super
Date/Time: 30/06/2010 00:16:34

Access to companies <is> Root

Advantages of NISP <is> Root

Attitude companies towards the programme <is> Root

Attraction of members <is> Root

Barrier- Responsibility <is> Root

Barrier_ Landfill tax too low <is> Root

Barriers-Transportation costs <is> Root

Barriers_ communication <is> Root

Benefits of collaborating with NISP <is> Root

Big companies have large volumes of waste of a more consistent nature <is> Root

Big companies that help us to achieve our targets <is> Root

Building relations <is> Root

Calculations of the outcomes generated by the programme <is> Root

Challenges_ changes in regional teams <is> Root

Challenges_ discontinuous funding of the programme <is> Root

Change in the conception of waste as a resource <is> Root

Change of strategy depending on contact person <is> Root

Channels of communication <is> Root

Cleaning up of materials prior IS exchange <is> Root

Collaboration with NISP has also help the company to find new IS opportunities on its own <is>

Root

Communication- NISP as intermediary <is> Root

complementarity between KTN and NISP <is> Root

Concept of waste <is> Root

Conditions for IS exchanges <is> Root

Confidentiality <is> Root

Cooperation in one project bring out more opportunities of cooperation <is> Root

Core members <is> Root

Cost-effectiveness of NISP <is> Root

Cross sectional synergies the focus of NISP <is> Root

Cultural barriers-conception of waste <is> Root

Database matches need to be reviewed by practitioner <is> Root

Day to day work with the companies <is> Root

Definition of regional targets <is> Root

Difficult to attract companies in regions where NISP is not known <is> Root

Discourse focuses on potential economic gains <is> Root

Drivers for environmental management improvements <is> Root

Economic and environmental benefits of IS exchanges <is> Root

Emphasize economic savings and incentives <is> Root

Environment was regarded as a cost <is> Root

Evolving towards more complex projects involving a number of actors/companies <is> Root

Failure of potential IS exchanges <is> Root

Failure of potential IS opportunities <is> Root

Focus on big companies <is> Root

Following up IS exchanges <is> Root

Formalisation of IS exchanges in commercial contracts <is> Root

Frequent regional team changes <is> Root

Funding of NISP <is> Root

further recycling is technologically possible but not economically feasible at the moment <is> Root

Future trends <is> Root

Identifying IS opportunities is time consuming <is> Root

Impact of regional team changes on the relationship with members <is> Root

Importance of communication <is> Root

Interaction with other programmes <is> Root

Interaction with the company <is> Root

Introduce changes in structure of relative prices <is> Root

Involvement of NISP practitioners <is> Root

IS benefits <is> Root

IS exchanges are driven by economics <is> Root

IS exchanges improve bottom line <is> Root

IS exchanges need to be economically viable <is> Root

IS learning <is> Root

IS opportunities <is> Root

IS synergies require a lot of time to materialise <is> Root

It fosters communication among companies <is> Root

It is free of charge <is> Root

It is simple <is> Root

Key success factors <is> Root

Knowledge transfer <is> Root

Lack of information to plan resource economy <is> Root

Landfill tax <is> Root

Landfilling won't be an option in 10 years <is> Root

lateral thinking in finding new uses for resources- NISP may help with this <is> Root

Learning across different regional programmes <is> Root

Lessons learnt- from waste to resource <is> Root

Lessons learnt- Hierarchy of waste management options <is> Root

Limitations <is> Root

Limitations of CRISP <is> Root

Main areas of IS exchanges <is> Root

Market failure <is> Root

Material flows <is> Root

Member companies with a high environmental profile <is> Root

Monitoring and follow-up of synergies <is> Root

Most matches fail to materialise as IS exchanges <is> Root

Need to address the key person in the company <is> Root

Need to be sure that companies report all IS opportunities created by NISP <is> Root

Need to have a basic understanding of the companies' needs <is> Root

Negotiation of the commercial agreement as a common cause of failure of IS exchanges <is> Root

Network of recycling opportunities is developed <is> Root

NISP an option to find cheaper outlets for waste materials <is> Root

NISP and technological development and innovation <is> Root

NISP as a resource_not waste_ programme <is> Root

NISP Database <is> Root

NISP facilitator in identifying IS opportunities <is> Root

NISP focus on large volumes <is> Root

NISP networks_ contacts to make IS possible <is> Root

NISP relation with environmental agency and other support programmes <is> Root

NISP should cooperate with other supporting programmes <is> Root

NISP strategy <is> Root

NISP was interested because of the large volumes generated <is> Root

Once companies are brought together, NISP should step backwards <is> Root

Outcomes of the workshop <is> Root

PAG's role <is> Root

People generally is prepared to talk <is> Root

Phases on IS development <is> Root

Pilot project in the mersey back <is> Root

Point to the environmental benefits <is> Root

Policy commitment to create an.. <is> Root

Pragmatical approach-the use of case studies and success stories <is> Root

Preexisting networks <is> Root

Problem_ downsizing of companies and lack of technical expertise <is> Root

Process of building the methodology <is> Root

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We don't have time <is> Root

Working concept of IS <is> Root

Workshop main tool to recruit companies <is> Root

Workshop methodology <is> Root

Workshops <is> Root

5. Primary Document-Code

CODES-PRIMARY-DOCUMENTS-TABLE (CELL=Q-FREQ)
 Report created by Super - 10/05/2010 16:30:35
 "HU: [R:\PHD\NISP\NISP.hpr5]"

Code-Filter: All [156]
 PD-Filter: All [11]
 Quotation-Filter: All [216]

CODES	PRIMARY DOCS										
	4	5	6	7	8	9	10	11	12	13	14
Totals											
Access to companies	0	0	0	0	1	0	0	0	0	0	0
Advantages of NISP	0	0	0	0	1	0	0	0	0	0	0
Attitude companies t	0	0	0	0	0	1	0	0	0	0	0
Attraction of member	0	0	0	0	1	0	0	0	0	1	0
Barrier- Responsabil	1	0	0	0	0	0	0	0	0	0	0
Barrier_ Landfill ta	3	0	0	0	0	0	0	0	0	0	2
Barriers-Transportat	1	0	0	0	1	0	0	0	0	0	0
Barriers_ communicat	0	0	0	0	0	0	0	0	0	0	1
Benefits of collabor	0	0	0	2	0	0	0	0	0	0	0
Big companies have l	0	0	0	0	0	0	0	0	1	1	0
Big companies that h	0	0	0	0	1	1	0	0	1	1	0
Building relations	0	0	0	0	0	0	0	0	0	2	0
Calculations of the	0	0	1	0	0	0	0	1	0	0	1
Challenges_ changes	0	0	0	0	0	0	0	0	2	0	0
Challenges_ disconti	0	0	0	0	0	0	0	0	0	0	1
Change in the concep	0	0	0	1	0	0	0	0	0	0	0
Change of strategy d	0	0	0	0	0	0	1	0	0	0	0
Channels of communic	0	0	1	0	0	0	0	0	0	0	0
Cleaning up of mater	1	0	0	0	0	0	0	0	0	0	0
Collaboration with N	0	0	0	1	0	0	0	0	0	0	0
Communication- NISP	0	1	0	0	0	0	0	0	0	1	0
complementarity betw	1	0	0	0	0	0	0	0	0	0	0
Concept of waste	0	1	0	1	0	0	0	0	0	0	0
Conditions for IS ex	0	1	0	0	0	0	0	0	0	0	0
Confidentiality	0	1	0	0	1	0	0	1	0	0	1

4											
Cooperation in one p	0	0	0	0	0	0	0	1	0	0	0
1											
Core members	0	0	1	0	0	0	0	0	0	0	0
1											
Cost-effectiveness o	0	0	0	0	0	0	0	0	1	0	0
1											
Cross sectional syne	0	0	0	0	0	0	1	0	2	0	0
3											
Cultural barriers-co	0	0	0	0	0	0	0	0	1	0	0
1											
Database matches nee	0	0	0	0	1	0	0	0	0	0	0
1											
Day to day work with	0	0	0	0	2	0	0	0	0	0	1
3											
Definition of region	0	0	0	0	1	0	0	0	0	0	0
1											
Difficult to attract	0	0	0	0	0	0	0	1	0	1	0
2											
Discourse focuses on	0	0	0	0	0	1	0	0	0	0	0
1											
Drivers for environm	0	0	0	0	1	0	0	0	0	0	0
1											
Economic and environ	0	0	0	0	0	0	1	0	0	0	0
1											
Emphasize economic s	0	0	0	0	1	0	0	0	0	0	0
1											
Environment was rega	0	0	0	1	0	0	0	0	0	0	0
1											
Evolving towards mor	0	0	0	0	0	0	0	0	0	0	3
3											
Failure of potential	0	0	1	0	0	0	0	0	0	0	0
1											
Failure of potential	0	1	0	0	0	0	0	0	0	0	0
1											
Focus on big compani	0	0	0	0	0	0	1	1	0	0	0
2											
Following up IS exch	0	0	0	0	1	0	0	1	1	0	0
3											
Formalisation of IS	0	1	0	0	0	0	0	0	0	0	0
1											
Frequent regional te	0	0	0	0	0	0	1	0	1	0	0
2											
Funding of NISP	0	0	1	0	0	0	0	0	0	0	0
1											
further recycling is	1	0	0	0	0	0	0	0	0	0	0
1											
Future trends	0	0	0	0	0	1	0	0	0	0	0
1											
Identifying IS oppor	0	0	0	1	0	0	0	0	0	0	0
1											
Impact of regional t	0	0	1	0	0	0	1	0	1	0	0
3											
Importance of commun	0	2	0	0	0	0	0	0	0	0	0
2											
Interaction with oth	0	0	1	0	0	0	0	0	0	0	0
1											
Interaction with the	0	0	0	0	0	0	0	0	1	0	0
1											
Introduce changes in	0	0	0	0	1	0	0	0	0	0	0
1											
Involvement of NISP	0	1	0	0	0	0	0	0	0	0	0
1											
IS benefits	0	0	0	1	0	0	0	0	0	0	0
1											
IS exchanges are dri	1	0	1	0	0	0	0	1	1	1	1
6											
IS exchanges improve	0	0	0	0	0	0	0	0	0	1	1
2											

IS exchanges need to 1	0	0	1	0	0	0	0	0	0	0	0
IS learning 2	0	1	0	1	0	0	0	0	0	0	0
IS opportunities 1	0	1	0	0	0	0	0	0	0	0	0
IS synergies require 5	0	0	0	1	1	0	0	1	2	0	0
It fosters communica 1	0	0	0	0	0	0	0	0	0	0	1
It is free of charge 9	0	0	1	0	2	1	2	0	1	1	1
It is simple 3	0	0	0	0	1	0	0	0	0	0	2
Key success factors 2	0	0	0	0	0	0	0	0	0	0	2
Knowledge transfer 2	0	0	0	0	0	0	0	0	2	0	0
Lack of information 1	1	0	0	0	0	0	0	0	0	0	0
Landfill tax 2	1	0	0	0	0	0	0	0	0	0	1
Landfilling won't be 1	1	0	0	0	0	0	0	0	0	0	0
lateral thinking in 2	1	0	0	1	0	0	0	0	0	0	0
Learning across diff 7	0	0	0	0	0	0	0	1	3	3	0
Lessons learnt- from 1	0	0	0	1	0	0	0	0	0	0	0
Lessons leart- Hiera 1	0	0	0	1	0	0	0	0	0	0	0
Limitations 1	0	0	0	0	0	0	0	0	0	1	0
Limitations of CRISP 1	0	0	0	0	0	0	0	0	0	1	0
Main areas of IS exc 1	0	0	0	0	0	0	0	0	0	0	1
Market failure 3	3	0	0	0	0	0	0	0	0	0	0
Material flows 1	1	0	0	0	0	0	0	0	0	0	0
Member companies wit 1	0	0	1	0	0	0	0	0	0	0	0
Monitoring and follo 1	0	0	0	0	0	0	0	0	0	0	1
Most matches fail to 1	0	0	0	0	0	0	0	1	0	0	0
Need to address the 1	0	0	0	0	0	0	1	0	0	0	0
Need to be sure that 2	0	0	0	0	0	0	0	1	0	0	1
Need to have a basic 1	0	0	0	0	0	0	0	0	1	0	0
Negotiation of the c 3	0	0	1	0	1	0	0	1	0	0	0
Networok of recyclin 1	1	0	0	0	0	0	0	0	0	0	0
NISP an option to fi 1	1	0	0	0	0	0	0	0	0	0	0
NISP and technologic 1	0	0	1	0	0	0	0	0	0	0	0
NISP as a resource_n 1	0	1	0	0	0	0	0	0	0	0	0
NISP Database 7	0	0	0	0	1	0	0	0	3	2	1
NISP facilitator in 4	0	1	0	3	0	0	0	0	0	0	0
NISP focus on large	0	0	0	0	1	0	0	0	0	0	0

1											
NISP networks_ conta	0	1	0	0	0	0	0	0	0	0	0
1											
NISP relation with e	0	0	0	0	1	0	0	0	0	0	0
1											
NISP should cooperat	0	0	1	0	0	0	0	0	0	0	0
1											
NISP strategy	0	1	0	0	0	0	0	0	0	0	0
1											
NISP was interested	0	1	0	0	0	0	0	0	0	0	0
1											
Once companies are b	0	1	0	1	0	0	0	0	1	0	0
3											
Outcomes of the work	0	0	0	0	0	0	0	0	0	0	2
2											
PAG's role	0	0	1	0	0	0	0	2	1	0	0
4											
People generally is	0	0	0	0	0	0	0	0	0	0	1
1											
Phases on IS develop	0	0	0	0	0	0	0	1	0	0	0
1											
Pilot project in the	0	0	0	0	0	0	0	0	0	0	1
1											
Point to the environ	0	0	0	0	1	0	0	0	0	0	0
1											
Policy commitment to	1	0	0	0	0	0	0	0	0	0	0
1											
Pragmatical approach	0	0	0	0	1	0	0	0	0	0	0
1											
Preexisting networks	0	0	0	0	0	0	0	0	0	0	0
0											
Problem_ downsizing	0	0	0	0	1	0	0	0	0	0	0
1											
Process of building	0	0	0	0	0	0	0	0	0	0	0
0											
Quick win workshop	0	2	0	0	1	0	1	0	0	1	5
10											
reaction of the comp	0	0	0	0	1	0	0	0	0	1	0
2											
Reasons to contact N	0	1	0	1	0	0	0	0	0	0	0
2											
Recruitment strategy	0	0	0	0	0	1	0	0	1	0	2
4											
Recycling infrastruc	1	0	0	0	0	0	0	0	0	0	0
1											
Regulation as driver	0	0	0	1	0	0	0	0	0	0	0
1											
Regulation as driver	0	1	0	0	0	0	0	0	0	0	0
1											
Regulatory barriers_	0	2	0	0	2	0	0	1	1	0	1
7											
Regulatory bodies ar	0	0	0	0	0	0	0	1	0	0	0
1											
Relation with NISP r	0	0	0	1	0	0	0	0	0	0	0
1											
Relationship with re	0	0	0	0	0	0	0	0	0	0	1
1											
relevance of environ	0	0	0	1	0	0	0	0	0	0	0
1											
Reputation_key in at	0	0	0	0	1	0	0	0	0	1	0
2											
Resource economy	3	0	0	0	0	0	0	0	0	0	0
3											
Short mental distanc	0	0	0	0	0	0	0	1	0	0	0
1											
Small volumes of was	0	0	0	0	0	0	0	1	0	0	0
1											
Solution providers	0	0	0	0	0	1	0	0	1	1	0
3											

Start of the program	0	0	0	0	0	0	0	0	0	0	0
0											
Strategy designing	0	0	1	0	0	0	0	1	1	0	0
3											
Structure of NISP as	0	0	0	0	0	0	0	0	2	0	0
2											
Structure of the reg	0	0	1	0	0	0	0	0	0	0	0
1											
Study material flows	2	0	0	0	0	0	0	0	0	0	0
2											
Synergies not accoun	0	0	0	0	0	0	0	0	0	0	0
0											
Talk to regulatory b	0	0	0	0	1	0	0	0	0	0	0
1											
Technological barrie	0	1	0	0	0	0	0	0	1	1	1
4											
Technological barrie	0	0	0	0	2	0	0	0	0	0	0
2											
The evolution of NIS	0	2	0	0	0	0	0	0	0	0	0
2											
The hidden cost of w	0	0	0	0	1	0	0	0	0	0	0
1											
The origins of NISP	0	0	0	0	0	0	0	0	0	0	2
2											
The relationship bet	0	1	0	0	0	0	0	0	0	0	0
1											
The role of EMSs	0	1	0	0	0	0	0	0	0	0	0
1											
The role of geograph	0	0	0	0	0	0	0	0	1	0	0
1											
The role of NISP in	0	0	0	0	1	0	0	0	0	0	0
1											
The role of NISP in	1	0	0	0	0	0	0	0	0	0	0
1											
The role of waste ma	1	0	0	0	0	0	0	0	0	0	0
1											
There are other supp	0	0	0	0	1	0	0	0	0	0	0
1											
There is not enough	1	0	0	0	0	0	0	0	0	0	0
1											
Transition team	0	0	0	0	0	0	0	1	0	0	0
1											
Waste maanger sector	1	0	0	0	0	0	0	0	0	0	0
1											
waste need to be seg	0	0	0	0	1	0	0	0	0	0	0
1											
We don't have time	0	0	0	1	0	0	0	0	0	0	0
1											
Working concept of I	0	0	0	0	0	0	0	0	1	0	0
1											
Workshop main tool t	0	0	0	0	0	0	0	1	0	0	0
1											
Workshop methodology	0	0	0	0	0	0	0	0	0	0	1
1											
Workshops	0	0	0	0	0	0	0	0	0	0	0
0											

Totals	30	28	17	22	37	7	10	22	36	22	40
271											

Appendix E

Published Journal Papers
