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Table of Contents

1	Version Log	4
2	Definitions and Acronyms	5
3	Management Summary	5
4	Introduction	6
5	Activities carried out and Results	7
	5.1 London Air Quality Discovery Trip	8
	5.2 Bristol Knowledge Mobilisation Forum Discovery Trip	10
	5.3 “Citizen Science & Open Science - Synergies and Instruments” Workshop, Brussels	11
	5.4 London Environmental Citizen Science Discovery Trip	12
	5.5 Italy National Strategy Discovery Trip	13
	5.6 Beyond DITOs: Knowledge sharing with other H2020 projects Discovery Trip	15
	5.7 Spaces for knowledge creation & other contributions to DITOs	15
6	Conclusions and reflections	18

List of Figures

Figure 1. Polish delegates at final workshop of Discovery Trip to London on air quality	10
Figure 2. Participants of the European stakeholder roundtable organised by UCL and Tekiu	13
Figure 3. Italian roundtable participants	14

1 Version Log

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2 Definitions and Acronyms

Acronyms	Definitions
CSA	Coordination and Support Action
COP24	UN climate change conference, Katowice, Poland, 2018
COST	Cost Action programme
DITOs	Doing It Together science
DT	Discovery Trip
EC	European Commission
ECSA	European Citizen Science Association / Verein der Europäischen Bürgerwissenschaften
eutema	EUTEMA GMBH
H2020	Horizon 2020 Programme
KI	Kersnikova Institute
KPI	Key Performance Indicator
MEP	Member of European Parliament
Meritum	Centrum Szkolen I Rozwoju Osobistego Meritum
MP	Medialab Prado, Madrid
OSPP	Open Science Policy Platform
RBINS	Institut Royal des Sciences Naturelles de Belgique
RRI	Responsible Research and Innovation
Tekiu	Tekiu Limited
UCL	University College London
UNIGE	Universite de Geneve
UPD	Universite Paris Descartes
WP	Work package
WP4T3	Work package 4, task 3: Educational discovery trips
WS	Waag Society
UNESCO-SIDS	United Nations Educational, Scientific and Cultural Organization's plan for Small Island Developing States
Zenodo	An open access online repository

3 Management Summary

Through six core deliverables and twelve additional non-deliverable contributions, DITOs through Tekiu has influenced at least 206 decision makers from more than ten countries to further the goals of DITOs and to generally enhance and promote the active engagement of the public in science, and ultimately bolster support for citizen science activities throughout Europe.

From discussing policies for the monitoring and tackling of air pollution in cities, to developing hands-on strategies for bottom-up behavioural change, the Polish Air Quality Discovery Trip delegation took their learnings home to Silesia, where little over a year later they had applied their knowledge to not only improve citizen science projects in Poland, but also showcase these at COP24 in Katowice. One of the

delegates of the Air Quality Discovery Trip went on to become an elected city councillor and through this can implement some of the learnings in Katowice.

By partnering with organisations such as the Knowledge Mobilisation Forum in Bristol, UK, we extended the reach of DITOs to new practitioner audiences and geographies. This Discovery Trip delivered an interactive session of knowledge exchange with a focus on citizen engagement practices, where attendees met inspiring practitioners in environmental citizen science and citizen-led biotechnology who put knowledge mobilisation into practice.

Similarly, Tekiu worked closely with DITOs partners ECSA and eutema to design and deliver the workshop “Citizen science & open science: Synergies and instruments” in Brussels, which brought together different communities and invited, in particular, those who work toward exploring opportunities for the adoption of open science and reducing the technical, legal and other barriers to adopting it. These included members of the Open Science Working Groups of ECSA and the advisory board of the EC, and the OSPP (Open Science Policy Platform).

Tekiu also organised a Discovery Trip with international delegates to complement the European stakeholder roundtable organised by UCL and Tekiu, “Identifying the opportunities, barriers, disruptions, and social innovation in integrating environmental citizen science in policy: road map for the next decade”. The Discovery Trip took delegates from UNESCO-SIDS and European organisations to visit local initiatives and converse with key UK decision makers. This provided the context for hands-on engagement at the roundtable and set out a roadmap for environmental citizen science in policy.

The First Italian Citizen Science Conference held in late 2017, provided an opportunity to bring together the emerging citizen science community in Italy and to share experiences of other European countries who have already established national networks. To contribute to this, build local capacity, and kick start the development of a national strategy for Italian citizen science, Tekiu’s Discovery Trip brought together local and international decision makers to learn from each other, and to engage in dialogue at local stakeholder roundtables.

The last Discovery Trip was linked to the project’s final event and brought leads of Horizon 2020 projects providing a platform for connections to promote future collaborations, to meet with project partners, discuss the project’s lessons learned and to carry the DITOs ‘torch’ forward into the future.

D4.4 Discovery Trips - Final report is Deliverable 4.4 (D4.4) from the coordination and support action (CSA) Doing It Together science (DITOs), grant agreement 709443.

4 Introduction

This deliverable reports on the activities and results from ‘Policy Engagement via Discovery Trips’ led by Tekiu as part of Work Package 4 (WP4) ‘Policy engagement for RRI’ (WP4 Task 3, Educational Discovery Trips). This task covers the planning, coordination, organisation and realisation of direct stakeholder engagement activities through Discovery Trips, Round Tables and a Pan-European Policy Forum. This report only covers Tekiu’s involvement in this task. Discovery Trips aimed to help fulfil the goals of WP4, which are: to extend the development of policy engagement in citizen science and DIY science across Europe, foster Responsible Research and Innovation

(RRI), link the pan-European citizen science and DIY science community to decision-makers at various levels and supporting innovation. Specifically, Tekiu's contributions supported the sharing of good practices of RRI and citizen engagement in science (Objective 4.1 - Elaborating, sharing and providing policy support on good practices of RRI activities with a focus on DITOs) and helping to channel societal inputs regarding responsible R&I policies to policy makers at different levels (Objective 4.3 - Channelling societal inputs regarding responsible R&I policies to policy makers at different levels, especially in the fields of Biodesign and Environmental Sustainability).

Tekiu is a knowledge transfer broker focused on creating opportunities for policy and decision makers to experience the latest developments in research and innovation within international settings. Tekiu works with groups from government, civil services, academia, industry and trade associations. The thematic focus is on the life sciences, digital economy, smart cities & environmental sciences and Tekiu's specialty geographies are Scandinavia, the United Kingdom, Turkey and German-speaking countries, although Tekiu has been active in other geographies and within other thematic themes also.

Tekiu's principle service is the Discovery Trip, which is a 2-3 day focussed fact-finding, technical or study visit to another country offering delegations the opportunity to meet with thought leaders and actively witness examples of good practice. Discovery Trips are designed based on the needs and interests of the delegates, who expect to learn concrete, practical, in-depth examples of how to improve their everyday work, e.g. how to digitalise healthcare information systems without compromising patient privacy regulations, or how to better integrate non-native speaking immigrants into the workplace. Discovery Trips provide exposure to a range of possibilities, solutions, insights, key stakeholders and often hands-on experiences that help delegates to make informed decisions about pressing issues back in their home country and organisations. Tekiu's clients often remark that they were able to learn a great deal through thoughtful facilitation by Tekiu staff, and without having to worry about the logistics so that they as participants could make the most of their hosts and other participants' knowledge.

Within DITOs, Tekiu organised Discovery Trips on the topics of biodesign, environmental sustainability and cross-cutting issues including air quality, knowledge mobilisation and open science, and policy impacts of environmental citizen science. Participants included local-level decision-makers within government and project leads within organisations with interest in citizen science. As we shall describe below, each Discovery Trip had different goals and followed different strategies based on the needs of the delegates and were also shaped by the contexts within which they were conceived.

5 Activities carried out and Results

This section outlines Tekiu's activities including Discovery Trips and additional contributions to WP4. Tables 1 and 2 below summarise these contributions and the following sections describe these activities in more detail.

Table 1. Summary of Discovery Trips delivered by Tekiu

Event/Output	WP	Description	Phase	Activity date	Month
London Air Quality Discovery Trip	4 & 2	Conception, planning and delivery of a 2.5 day Discovery Trip for 12 participants from Upper Silesia, Poland. Coordinated follow-up activities in collaboration with Meritum	2	25-27/09/2017	16
Bristol Knowledge Mobilisation Forum Discovery Trip	4 & 1	Conception, planning and delivery of a satellite event for UK Knowledge Mobilisation Forum	2	07/03/2018	22
"Citizen Science & Open Science - Synergies and Instruments" Workshop, Brussels	4	Collaboration to prepare agenda and moderation, dissemination to MEPs and OSPP. Replaced x1 DT	2	01/03/2018	22
London Environmental Citizen Science Discovery Trip	4 & 2	Conception, planning and delivery of a Discovery Trip in combination with European Stakeholder Roundtable. (collaboration with UCL - see separate entry below)	2	07-09/05/2018	23
Italy National Strategy Discovery Trip	4	Conception, planning and delivery of a Discovery Trip in combination with Local Stakeholder Roundtable. (collaboration with ECSA - see separate entry below)	2	04-06/04/2018	24
Beyond DITOs: Knowledge sharing with other H2020 projects	4	Conception, planning and delivery of a Discovery Trip for 6 participants, organisers of new or upcoming H2020 projects in Citizen Science and RRI	3	2-3/04/2019	36

5.1 London Air Quality Discovery Trip

In this Discovery Trip, Polish decision makers explored air quality policy and practices in London. This Discovery Trip builds on DITOs partner Meritum's experience and work on air quality monitoring; together with Meritum, Tekiu designed a study visit that would help provide decision makers with insights, approaches, and lessons learned on the topic. Over 2.5 days, the Polish delegates met with a range of UK organisations to learn about, share experiences, and build relationships around the topic of battling air pollution in cities. The delegates were a mixed group of individuals from regional city councils, governmental agencies, businesses and civil society organisations all from the metropolitan area of Katowice in the Silesia Voivodeship¹.

¹ https://en.wikipedia.org/wiki/Silesian_Voivodeship

London Air Quality Discovery Trip summary

Aim	Bring together Polish decision makers to learn about local initiatives and policy for air quality monitoring in London and set the foundations for initiatives to tackle air pollution in their region of Katowice.
Organisations involved	Meritum
Number of participants	12 Discovery Trip participants (4 women, 8 men); in addition to the audience numbers that participated in the face-to-face exchanges (36 total), a wider group of stakeholders was engaged during preparation in advance of the visit. This wider audience for the visit takes the total number to 48.
Host organisations	London Sustainability Exchange, Centre for Environmental Policy, Imperial College London, Lambeth Borough Council, Hackney Borough Council, City of London Borough Council; Transport for London, Innovate UK, Polish Embassy in London, Mapping for Change (Social Enterprise), and Future Cities Catapult
Countries involved	Poland, UK
Results / outputs	<p>Discovering how London is tackling Air Pollution London Sustainability Exchange²</p> <p>Blogging and tweeting increased the audience for the event using online engagement.</p> <p>The delegates created a commitment plan during the final workshop of the Discovery Trip (see Figure 1). From interviews and conversations with Polish DITOs partner, Meritum, we know that the delegates have applied their learnings from the UK to local initiatives and have showcased these at COP24 in Katowice, December 2018.</p>

² "Project of the Week" blogpost to be archived under Zenodo <https://zenodo.org/communities/ditos/>



Figure 1. Polish delegates at final workshop of Discovery Trip to London on air quality. Delegates place their hands on their strategy plan to implement solutions based on learnings from their trip (Photo credit: Cindy Regalado).

5.2 Bristol Knowledge Mobilisation Forum Discovery Trip

For this Discovery Trip, we designed a satellite event linked to the Bristol-based Knowledge Mobilisation Forum. The theme of the event was “Creative approaches to knowledge exchange” with a focus on citizen engagement practices. This interactive event provided an opportunity for conference attendees to get to know one another while meeting inspiring practitioners who put knowledge mobilisation into practice.

The meeting featured diverse fields ranging from environmental stewardship and open science to biohacking and citizen participation in policymaking. The approach to creative knowledge mobilisation included simple interactive activities to help participants explore knowledge exchange in a relaxed environment. This was done through show and tell presentations, a thought-provoking quiz, and by having our inspiring practitioners function as ‘dinner hosts’ to share their experiences in engagement methodologies and answer questions.

Bristol Knowledge Mobilisation Forum Discovery Trip summary

Aim	Create an interactive space to introduce knowledge mobilisation professionals to inspiring citizen engagement
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	practitioners
Organisations involved	Knowledge mobilisation professionals attending the 2017 Knowledge mobilisation forum
Number of participants	21 participants (15 women, 6 men)
Host organisations	UK Knowledge Mobilisation Forum; Centre for Interdisciplinary Research, UPD; Capturing our Coast Marine Citizen Science Project; Bristol Natural History Consortium Group, BentoBio
Countries involved	UK
Results / outputs	Inspired attendees exposed to citizen science in practice, as an attendee wrote: <i>"I found the session on "Creative approaches to knowledge exchange" really fascinating. Citizen Science is not a research model I had previously encountered. I have shared a brief summary, alongside Tekiu & presenter contacts with some of our partner organisations who are likely to take the ideas forward in the future."</i> ³

5.3 "Citizen Science & Open Science - Synergies and Instruments" Workshop, Brussels

Tekiu collaborated with DITOs partners ECSA and eutema to prepare the agenda and moderation of a workshop⁴ that explored the synergies and H2020 instruments in citizen science and open science. The workshop was organised by the COST Action "CA15212: to promote creativity, scientific literacy, and innovation throughout Europe" in collaboration with DITOs. Tekiu helped with dissemination to MEPs and OSPP and promote participation in the workshop. This contribution was an approved replacement of a traditional Discovery Trip. Tekiu also contributed to the writing and the review to the policy brief "Citizen Science and Open Science. Synergies and Future Areas of Work".

Citizen Science and Open Science Brussels Discovery Trip summary

Aim	Bring together key stakeholders from the EP, Open Science Working Group at ECSA, the Citizen Science Working Group at the EC, and OSPP, to explore barriers and synergies between citizen science and open science and H2020 instruments that can support a closer link between science and society in line with the three O strategy of the EU.
Organisations involved	Open Science Working Group of the European Citizen Science Association ECSA, Members of the European

³ <http://knowledgemobilisation.net/wp-content/uploads/2018/03/2018-Forum-programme.pdf>

⁴ <https://www.cs-eu.net/events/internal/workshop-wg-3-citizen-science-and-open-science-%E2%80%93-synergies-and-instruments>

	Parliament as well as the Citizen Science Working Group within the advisory board of the EC, OSPP (Open Science Policy Panel)
Number of participants	22 participants (12 women; 10 men)
Host organisation	ECSA, COST Association
Countries involved	Pan-European reach through organisations involved
Outputs	Presentation of Policy Brief on Citizen Science and Open Science launched at this event ⁵

5.4 London Environmental Citizen Science Discovery Trip

This Discovery Trip was organised to complement the European stakeholder roundtable organised by UCL and Tekiu Ltd: “Identifying the opportunities, barriers, disruptions, and social innovation in integrating environmental citizen science in policy: road map for the next decade”. The aim of the high-level policy roundtable was to set out a 5-10 years roadmap for the future of the UK, the EU, and the international environmental citizen science collaborations and policies to support them. We worked with representatives of UK national agencies to produce a set of realistic guidelines and gained input from international colleagues to ensure future cross-border alignment. The Discovery Trip for international participants included visits to local initiatives and meetings with key UK decision makers to provide the context for the roundtable discussions on the following day.

Environmental Citizen Science London Discovery Trip summary

Aim	A short programme for international decision makers to align UK and international practices and guidelines on environmental policy.
Organisations involved	GRID-Arendal; UNESCO -IHE Delft; JRC; Permanent Delegation of Palau - UNESCO - SIDS delegates; Botanic Garden Meise; Maldives Embassy
Number of participants	6 Discovery Trip participants; 31 host staff; 39 roundtable participants
Host organisations	ZSL; Natural History Museum; OPAL; UCL; Stockholm Environment Institute; Mapping for Change
Countries involved	Norway, The Netherlands, Palau, Belgium, Maldives
Results / outputs	Introduced delegates to citizen science strategies and

⁵ https://ecsa.citizen-science.net/sites/default/files/ditos-policybrief3-20180208-citizen_science_and_open_science_synergies_and_future_areas_of_work.pdf

	policy perspectives; International insights contributed to the policy roundtable on the Integration of Environmental Citizen Science into Environmental Policy
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Figure 2. Participants of the European stakeholder roundtable organised by UCL and Tekiu discuss environmental stakeholders for citizen science collaborations and policies to support these (Photo credit: UCL).

5.5 Italy National Strategy Discovery Trip

This Discovery Trip involved local and international decision makers in building capacity and developing a national strategy for Italian citizen science. The delegation visit included a trip to Grosseto to meet with local citizen science stakeholders in preparations for the local stakeholder roundtable⁶, which was co-organised by the European Citizen Science Association, the Accademia Nazionale delle Scienze detta dei XL and Tekiu Ltd.

The First Italian Citizen Science Conference, held 23-25th November 2017 in Rome, was a great opportunity to bring together the emerging citizen science community in Italy and to share experiences of other European countries who have already established national networks. This Discovery Trip introduced international

⁶ http://togetherscience.eu/events/local-stakeholder-roundtable-dito-s-good-practices-phase-2_kjmbm

stakeholders to the citizen initiatives active in Italy and provided the context for the roundtable discussions on the following day.

Italy National Strategy Discovery Trip summary

Aim	A study visit for Key European citizen science practitioners to share insights towards Italian National Citizen Science Strategy
Organisations involved	Citizen Science Italian community; Italian National Academy of Sciences; Rome City Council; ISPRA (Italian Environmental Protection Agency); Natural History Museum of Maremma; Accademia Nazionale delle Scienze detta dei XL; Roundtable: Austrian Citizen Science Network; Helmholtz-Center for Environmental Research, German Centre for Integrative Biodiversity Research; Boku University; Atlas of Living Australia
Number of participants	5 DT participants; 29 at roundtable - all male
Host organisations	ECSA; Accademia Nazionale delle Scienze detta dei XL
Countries involved	Italy, Austria, Germany
Results / outputs	Bringing insights to inform the policy roundtable for Italian national stakeholders to guide the development of a national strategy for the implementation of citizen science in Italy



Figure 3. Italian roundtable participants (Photo credit: ECSA).

5.6 Beyond DITOs: Knowledge sharing with other H2020 projects Discovery Trip

This Discovery Trip supported the spirit of the DITOs final event on the 3rd of April: to celebrate with those who have made DITOs possible and to share our results and lessons learned with leaders of recently started projects in the topics of RRI and public engagement in science. Tekiu identified (through a search in Cordis) and extended invitations to leads of Horizon 2020 projects to join our DITOs final events. Tekiu facilitated 1:1 targeted meetings between delegates and event attendees, enabling our final event to function as a platform for connections to promote future collaborations. The invited projects were SUPER_MoRRI, Inspires, and Scalings.

Beyond DITOs Discovery Trip summary

Aim	Create spaces for knowledge sharing (in particular lessons learned as DITOs comes to a close) between DITOs partners and representatives of recently started H2020 projects working on citizen engagement with science and/or RRI
Organisations involved	ISGlobal (Spain), Social Innovation Exchange (UK), Eindhoven University of Technology (TUE)
Number of participants	5
Host organisations	RBINS, DITOs partners co-organising the final event
Countries involved	Spain, The Netherlands, UK, Germany
Results / outputs	Connections between H2020 projects and DITOs final event attendees

5.7 Spaces for knowledge creation & other contributions to DITOs

In addition to designing and delivering Discovery Trips, Tekiu was also involved in activities supporting the fulfilment of WP4. These contributions are summarised in Table 2 below.

Table 2. Summary of additional (non-deliverable) contributions to WP4 delivered by Tekiu

Event/Output	Activity type	WP	Description	Phase	Activity date	Month
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MEP briefing on Citizen Science: Support for EU Environmental and Research Policies	Spaces for knowledge exchange	4 & 2	Dissemination to MEPs - invitations sent to UK MEPs and other DITOs countries. Collaboration to prepare agenda, survey and ECSA presentation. Blog & report ⁷ .	1	07/2016-09/2016	4
European Stakeholder Round Table on Citizen, DIY Science and Responsible Research and Innovation	Spaces for knowledge exchange	4 & 1	Discussion moderator: A Vision for Citizen Science 2030, Report contribution and blog on ECSA website. Established link with OSPP and Philippe Galiay (DG RTD) Report ⁸ and Blog ⁹	1	11/2016	6
"Global 'Citizen Science' Observatory" Workshop with UNESCO	Spaces for knowledge exchange	1, 2, 3 & 4	Concept and content development with Claudia Göbel and Khalissa Ikhlef of UNESCO. Delivery of DITOs presentation at workshop, contribution to internal report summary & suggestions of future collaborations on DTs. Followed up in Phase 2 to recruit 2 participants for UCL DT. Workshop Summary ¹⁰ .	1	01/2017 - 03/2017	10
"Tools for Policy Engagement" workshop at Biofabbing Conference	Spaces for knowledge exchange	4 & 1	Liaised with conference organisers to propose a session on policy engagement. Conceived, planned and delivered a Policy tools workshop for the DIYbio community. Needs assessment calls with DIYbio community representative (Lucy Patterson) in advance of conference. Attended by key members of the DIYbio community. Presentation online ¹¹ .	1	12/2016 - 05/2017	12

⁷ <https://ecsa.citizen-science.net/blog/summary-meps-briefing-citizen-science-european-parliament-brussels>

⁸ https://ecsa.citizen-science.net/sites/default/files/report_on_ditos_round_table_on_citizen_science_diy_science_and_rii.pdf

⁹ <https://ecsa.citizen-science.net/blog/european-stakeholder-round-table-citizen-diy-science-and-responsible-research-and-innovation>

¹⁰ https://ecsa.citizen-science.net/sites/default/files/report_on_unesco_global_citizen_science_observatory_meeting_0.pdf

¹¹

https://docs.google.com/presentation/d/1oiJSMztEWiZr6ipnwyULyWfTOdKZSQHAMvELd5lXGpE/edit#slide=id.g222424a94d_0_24

UK science bus organisation	Spaces for knowledge exchange	3	Planning of UK route - x4 locations/stops	1	03/2017-06/2017	13
Sheffield Science in Public conference session	Spaces for knowledge exchange	1 & 2	Preparation of agenda, briefing speakers, presentation of Tekiu activities/DITOs	1	05/2017 - 07/2017	14
JCOM article on knowledge transfer & DIY science	Dissemination - publication	1, 2 & 3	Dissemination of outcomes of SiP session.	2	08/2017 - 09/2017	16
Policy Brief #3 "Citizen Science and Open Science. Synergies and Future Areas of Work"	Dissemination - publication	4 & 1	Contributed to writing and review the policy brief ¹²	1	06/2017 - 09/2017	16
COST short-term scientific mission: "Strengthening of strategic collaboration on activities and outputs for policy engagement related to citizen science across Europe"	Spaces for knowledge exchange	3	Capacity building for WP4 with the aim of learning from each other's methodologies and expertise, elaborating the strategy and coordination for policy engagement between Tekiu and ECSA, organising and coordinating the delivery of forthcoming events and outputs, and the dissemination of results. Report ¹³ .	2	01/2018	20
"Citizen Science: Expertise, Democracy, and Public Participation." Report to the Swiss Science Council. Bern, Switzerland, 2018	Dissemination - publication	4	Contributed writing report focusing on policy. Report to the Swiss Science Council ¹⁴ .	1	12/2017 - 03/2018	22
ECSA Green Week Conference Session: "Making our cities green with citizen science"	Spaces for knowledge exchange	4 & 2	Involved in planning concept and content for ECSA conference session.	2	11/2017 - 03/2018	22

¹² https://ecsa.citizen-science.net/sites/default/files/ditos-policybrief3-20180208-citizen_science_and_open_science_synergies_and_future_areas_of_work.pdf

¹³ https://www.cs-eu.net/sites/default/files/media/2018/03/CA15212_STSM_Report_AleksandraBerditchevskaia.pdf

¹⁴ http://citizensciences.net/wp-content/plugins/zotpress/lib/request/request.dl.php?api_user_id=424601&key=T4QRUDX9&content_type=application/pdf

Policy Brief #2 "Do It Yourself Biotechnology (DIYBio) for open, inclusive, responsible Biotechnology"	Dissemination - publication	4 & 1	Contributed to writing and review the policy brief ¹⁵	1	11/2017 - 05/2018	24
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6 Conclusions and reflections

This deliverable has described Tekiu's contributions to DITOs WP4, both our deliverables - 'Policy Engagement via Discovery Trips' - and the facilitation of knowledge exchange through roundtables, presentations, publication of reports, policy briefs and articles. Together, these have fulfilled the tasks set out by DITOs in the "*planning, coordination, organisation and realisation of direct stakeholder engagement activities*" (WPT3).

By bringing together key stakeholders from across Europe and beyond, the Discovery Trips fulfilled the DITOs WP objectives through the development of policy engagement in citizen science and DIY science. We also fostered RRI through sharing good practices across borders, laying the foundations to develop strategies and commitments (as with the Polish delegation, the Knowledge Mobilisation Forum, and the Environmental Citizen Science in Policy roundtable), and supporting connections for future collaborations (as in our Italian and final event Discovery Trips). Through our Discovery Trips and additional contributions, we also linked the pan-European citizen science and DIY science community to decision-makers at various levels (from municipal leaders to MEPs) and supported innovation by exposing decision-makers to solutions internationally.

6.1 Reflections

One of our main lessons learned is that there is a very strong appetite for sharing and mutual learning at the policy level. There is also interest in supporting initiatives for active engagement of citizens in environmental issues. However, we also see that we are at the very early stages of these exchanges and much more support is needed to maintain and nurture these channels that DITOs has promoted.

One of the main challenges faced in WP4 in terms of outreach to policy and decision-makers was not collectively crafting a cohesive message and linking this to an outreach strategy from the start of the project.

In addition, there was a mismatch between the way the project was designed/operated and the level at which partners found it relevant to engage with policy and decision makers; DITOs was designed to operate at the European level whereas partners found that it was most relevant to them to work at the level of their own countries/cities. It was not straightforward to bridge between these two radically different contexts.

¹⁵ <https://ecsa.citizen-science.net/sites/default/files/ditos-policybrief2-20171004-diybio.pdf>

In addition, while partners valued policy engagement, it was also (understandably) not the priority for those who had many public engagement events of their own to deliver.

It is not possible to generalise on trends or patterns observed in our interactions with policy/decision-makers as there was no consistent mode of engagement with the policy audience. Our approach was 'bottom-up' (starting with issues/individuals) and taking advantage of opportunities as they arose. This meant that we were able to benefit from 'changing tides' that were amenable to citizen science e.g. the Paris European Policy Forum at a time when there was a big push for participatory science and the Open Science & Citizen Science policy brief. We did observe differences between countries, while likely stem from cultural effects when it comes to public engagement with science. However, a broader contextual trend is the increased penetration of citizen science within environmental policy (particularly when it comes to monitoring) and the shifting narrative that pitched citizen science as a part of open science.

To address some of the above challenges, we mapped our policy engagement activities and draw out the recurrent themes/links post hoc, which was helpful in understanding what we had achieved as a project. We also identified and worked with key citizen science supporters and champions (e.g. Sven Schade), who helped us to reach out to decision-makers that we might not have been able to access otherwise.

6.2 Future opportunities

As noted above, there are many opportunities for policy engagement within citizen engagement with science: the timing is right and the appetite is still growing.

There are specific opportunities to engage at the middle level of decision making. For example, university membership organisations, professional scientist membership societies (e.g. as with the Italian Academy who really helped to propel our efforts with the Italian policy roundtable). There is opportunity here as many of the challenges that citizen science faces are about resistance from traditional academia.

There is also an opportunity to emphasise more of the innovation potential of citizen science. It is more challenging to build interest on this and present its value compared to the obvious benefits of environmental monitoring. We have observed that is because largescale engagement generally seems to more readily catch the attention of decision makers.

There are also opportunities to explore related civic causes and build thematic bridges to collaborate with them. This could bring strength to the citizen science policy engagement movement, as some of these communities have much more experience in reaching out to the policy world and our work could extend their initiatives.

Finally, there are many opportunities in furthering the use of citizen science as a method of research, because it is so clearly seen by many if not most stakeholders to be far more inclusive of local and community interests. In the long run, this opportunity may manifest itself in greater public understanding of science and vice versa better understanding by institutional researchers of the needs of the communities that ultimately sustain their R&D budgets.