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Commission



**The Art
+ Science
+ Policy Nexus**

Joint
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Cover: Elle Márjá Eira, still from the film “Ealát”, 2021.

Ealát (or Good pasture) is a story about living and surviving in Sámi reindeer husbandry in strange times of climate shifts. Screened at the JRC SciArt Summer School (Ispra, IT) on the topic of “NaturArchy: Towards a Natural Contract” in June 2022

Abstract

In the context of increasing numbers of interdisciplinary and transdisciplinary projects, alongside increasing numbers of projects engaging with civil society, this scoping study explores activities at the nexus of art, science and policy. Drawing on examples from across Europe, these activities are presented in a preliminary typology of interaction between art-science and policy/policymakers. Routes for further research are identified, as are a set of recommendations for further understanding the art-science-policy landscape and the impact of these endeavours on both policy and broader societal challenges, with a focus on sustainability.

Executive Summary

How do cutting edge art-science initiatives intersect with policy? This scoping study surveys the landscape of the art-science-policy network, focusing on how and when art-science projects interact with policy and policymakers. What emerges is a diversity of channels by which learning and ideas from art-science make their way to policy – through policy briefs, events, exhibitions and more – but few programmes through which policymakers at any level actively participate in the genesis of project ideas or the creation of transdisciplinary works.

Based on the scoping study research and drawing inspiration from methods of developing typologies of interdisciplinary collaboration, this study proposes a preliminary typology for action at the art-science-policy nexus, based on the direction of flow of knowledge – ie: the sharing of outcomes and findings from programmes via policy briefings, versus the cooperation of policymakers in expert groups for artist residencies. From this, routes forward are proposed for the next steps in understanding these activities in terms of their impact on policy and broader societal challenges, including in-depth longitudinal studies on the impact of participation in art-science-policy programmes and the tracing of recommendations from policy briefings into policy and funding priorities.

About this report

This report scopes the landscape of initiatives, programmes and projects that connect art and science practice with policymaking and policymakers. The geographic focus is mainly Europe, with research encompassing exceptional examples from around the globe.

The report has been commissioned by the Joint Research Centre (JRC) in the context of their own art-science programme. The JRC SciArt project was established in January 2016, with the objective of triggering innovation in research and bring together science, art and society. Strongly influenced by the JRC mission of doing science in support of policy, it gives scientists, artists and policymakers the opportunity to meet and work together to discuss, investigate and explore the wide intersecting plains between different ways of knowing and learning, with a tension towards impacting our collectivities. The project tries to create a safe haven to freely roam possible worlds, spark unusual connections, pursue impossible projects, and to embrace failure.

The flagship initiative of the JRC SciArt project is Resonances. Within a two-year cycle, scientists, artists and policymakers first come together at a Summer School to exchange, discuss, probe topics of relevance to the JRC and the European Commission. Inspired by these meetings, artists can propose artistic research projects in close collaboration with their researcher(s). After a residency period at the JRC where deeper transdisciplinary interactions take place, the JRC SciArt project produces the artworks resulting from these processes, to then exhibit them in major European venues - fomenting conversations with and between citizens, augmenting public engagement, and turning these works into cultural products of contemporary significance.

The current Resonances cycle, called *NaturArchy*, is dedicated to the topic of deep ecology, strong sustainability and the decolonisation of Nature. Previous Resonances topics include *datami* (your data tatami - Reso Resonances III 2018-2019), *Fair/Fear* (Resonances II 2016-2017) and Food (Resonances I 2015).

Preface

The Joint Research Centre (JRC) is the European Commission's scientific hub for independent research developing evidence, tools and advice in support of EU policies. Spread across six sites in five European countries, the JRC covers any topic pertinent to EU laws and policies. Scientists are asked to provide accurate, effective, scientifically sound information for policymakers to have a well-informed, evidence-based overview of the complex issue at hand. The inclusion of arts-based research in the inner machinery of the JRC is proving to be an engaging way to bring transdisciplinary thinking and practice into the heart of policy. The launch of the New European Bauhaus in 2020 has additionally been setting a trend in valorising the inclusion of the arts and creative sectors as a way to foster systemic change and knowledge valorisation.

The JRC SciArt project was initiated in 2016 by Director-General Vladimír Šucha who saw the potential of bringing artistic research into the corporate culture of the JRC as a mean to drive change, stimulate innovation, bolster outreach, and connect to society. Throughout the years, the project has indeed encouraged creative, transdisciplinary contributions to the scientific culture of the organisation through on-site presence of artists and the production of artworks influenced by scientific research. It has contributed to dipping scientific research in the needs and perspectives of arts-led research, precipitating scientific inquiry and knowledge to the non-scientific realm, and introducing key science-for-policy challenges, inquiries, expectations and working modes in the creative explorations of artists. The programme by now has shown its capacity to ground scientific research within a cultural context, making it relatable and thus more meaningful and relevant to society, contesting disciplinary silos, and co-creating new imaginaries.

Appreciating the increasing number of scientific institutions that implement internal art-science activities, and informed by the JRC's proximity to public pol-

icy-making, the present study wants to push forward investigations in the significance of art-science for the policymaking process. In particular, what art-science programmes around the globe are positioned at the nexus of policymaking? For what reason have these emerged? How are these structured, and what is the value added? In what way, if at all, does close contact with artists affect the practice of policymaking, and what is the impact of embedding policymakers in the collaborative process of art-science?

The JRC SciArt project promotes art-science practices in evidence-informed policymaking ecosystems. By doing so, it experiments with various forms of collaboration that challenge prevailing geometries of knowledge. In itself, it does not produce policy briefings or recommendations, and to the present moment does not advise the Commission on matters of concern relating to the arts and culture or other. What it does, though, is to include policymakers in a co-creation process,

thereby brokering, facilitating and curating deep interactions between the scientist, artist and policymaker from the very beginning of the collaborative phase. From a first implementation phase primarily focussed on tailoring a suitable programme and successful exchanges between artists and scientists, the JRC project has now placed greater emphasis on understanding the effect of its presence on the policymaking process in which it is embedded. How does work at the intersections of arts and sciences support policymaking? Why is it important for artists to be involved in policymaking processes, especially when the policies involved are not culture or arts based? It is our belief that the arts - with their specific context-aware research methodologies and critical inquiry beyond the spoken or written, with its strong dependence on aesthetics and its specific output in the form of an artwork - has a vigorous role to play in the development of policies, thereby contributing to a systemic shift from within.

The following study scopes art-science projects, programmes and activities, primarily in Europe, that are positioned relative to policymaking to a number of differing degrees. Case studies are broken down into four main categories: sharing knowledge outputs such as reports or policy briefs; active engagement of policymakers, for instance in workshops, seminars, exhibition openings; collaboration of policymakers throughout the co-creation process; and providing critical perspectives on policies and social challenges rather than collaborating with policymakers. It is interesting to note that out of the 313 art-science programmes that currently exist in Europe (708 across the globe), this study has identified 18 linking to policymaking. This opens the question of how the JRC's art-science project is positioned vis-à-vis this science-art-policy landscape: how many of these instances are based in scientific institutions? How many promote collaborations with policymakers in the co-creation process? What are their

findings? For now, this study provides a structured overview of existing projects engaging transdisciplinary processes in decision-making, for those administrations and organisations that want to engage further in the topic. At the same time it calls for the need to further examine how the arts can contribute significantly to valorising public decision-making and governance, with an eye on understanding the barriers against embedding the arts in scientific research and the policymaking cycle.

C. Benincasa

1. Introduction

Over recent years there has been a burgeoning of initiatives that explicitly engage art and science, whether this is through residency programmes, fellowships, summer schools, workshops or funding calls. Whether growing organically from pre-existing relationships or part of structure programmes, the value of the outcomes of such endeavours is gaining recognition within the disciplines of art and science themselves and contributing to a growing community of practitioners and experts within the field of art science, also known as hybrid arts or sciart. More than this, their value is increasingly recognised from outside these core fields, particularly in terms of the potential they hold for transformation and innovation brought about by their contributions to knowledge production – whether through participatory involvement of citizens, development of new materials and techniques, or in fostering changes in cultural norms.

In few areas are these contributions more valuable than in addressing sustainability challenges. It has been argued that we are now living in the age of the anthropocene (Crutzen, 2006). The term is a matter of contention, but regardless of whether one agrees with this terminology, it is indisputable that in recent decades increasing environmental stressors are contributing to global change on a scale hitherto unprecedented.

Faced with scientific data, media reportage, an overwhelming scientific consensus of not only global change, but also the part that human activities play in it, there are nevertheless multiple barriers on the road to achieving the sustainable development goals. One key barrier is a problem of knowing, where knowing on different levels affects decision-making – both in individual choices and at a community and policy level. The establishment in the last years of the New European Bauhaus initiative, with its goal of creating a future that is “beautiful, sustainable, together” (“New European Bauhaus,” n.d.), sends a clear signal that creativity is

considered by policymakers as a key factor to achieving the priorities of the European Green Deal (“European Green Deal,” 2022).

Art-science projects hold the potential to unlock new ways of addressing these goals, particularly if their unique perspective reaches into the policy domain. In this scoping study, the landscape of activities at the art-science policy nexus is explored, with a focus on activities within a European context. After a brief overview of recent but finished activities, a rapid tour through current activities precedes a brief analysis and recommendations for the future.

Sourcing information on projects at the art-science-policy nexus was, at times, challenging. Literature exploring the outcomes, typology and meaning of art-science has burgeoned in recent years (eg: Borgdorff et al., 2020; Reichle, 2021; Rogers et al., 2021). However, despite an emphasis on interdisciplinarity and collaboration in funding programmes both in Europe and beyond, there has been little focus on its intersection with policy and policymakers. The starting position for this research was, therefore to treat art-science as an object, not undertaking to assess the art-science (and technology) intersection, but rather to apply a

method for understanding the degrees of intersection between art-science and policy / policymakers. Starting the research using a traditional literature review, it became clear that the majority of sources would lie outside peer reviewed literature, taking the form not only of project reports and policy briefs, but often found hidden in the details of websites and blogs pertaining to art-science projects. A combination of internet searches using multiple search engines (Google, DuckDuckGo, Ecosia), snowballing and extended use of networks from experts and practitioners in the field, uncovered a variety of modes in which art-science intersects

with policy and policymakers. Drawing inspiration from taxonomies of interdisciplinary collaboration (Klein, 2010; Rogers et al., 2021), an initial typology has been developed for the art-science-policy nexus based around the direction of knowledge transfer between art-science and policy and the degree of blending, ie: the contribution by policymakers to concepts and ideas for projects at this intersection. However, to fully elaborate such a typology is beyond the scope of this initial study.



2. Current Practices where Art and Science intersect with Policy

Art-science or SciArt projects abound and the variety in the way they are organised and supported is matched with variety in the type of interaction they have with policy and policymakers. Some projects intersect with policy in more than one way. In the following, examples of these types of intersection are discussed through examples.

2.1 Sharing Knowledge Outputs

The most common form of engagement with policy is through sharing knowledge outputs of SciArt programmes, often through the production of policy briefings. This is certainly true for most activities carried out through European funding, such as S+T+ARTS activities (See Sections 2.2.2 and 2.4). Such processes have a long history. For instance, the FET-ART project was an FP7 (European Commission Seventh Framework Programme) funded project that arose from an 'ICT & ART Connect' event, organised by the EC's Future and Emerging Technologies (FET) Unit. The event took place in Brussels in April 2012. The project aimed to foster collaboration between Europe's ICT and art communities in order to identify new research avenues and associated challenges, and gauge the potential impact of such collaboration on science, technology, art, education and society. The project's main activities included a series of consultation and matchmaking events, as well as uniting artists and technologists in residencies (Torrenti, 2014, p 2). The programme resulted in 19 pilot projects addressing topics such as Big Data, health-care, AR, and the peaceful use of drones and satellite data. In the development of activities, as well as the residencies, the project experimented with a range of consultation techniques and collaboration and mentoring methodologies, as well as providing a set of policy recommendations at the end of the programme.

Penelope Cain, "Flourish", 2022.

Work developed within the S+T+ARTS Residency framework, exploring notions around micro-rewilding in 'the city' from a lichen-eye view to reimagine nature in the city. This project broadly centres on lichen as a role model and starting point to consider how nature, and interspecies communities in endangered landscapes, can survive and thrive within the Hague, where space is limited and 'nature' controlled. Image courtesy of Penelope Cain.

In some cases, it is within a scientific or research institution's remit to explicitly provide advice to policy based on the research carried out. The Potsdam Institute for Climate Impact Research (PIK) is one such institution, which has hosted artists in residence and promoted interdisciplinary collaborations since 2011. While the interaction with policy with PIK's arts activities are not specifically highlighted, the organisation has initiated multiple activities that communicate to policymakers and the general public, including a series of conferences hosted as part of the 'Tipping Point' project; 'The Climate Media Factory', which communicates climate science through audiovisual media; a collaboration with 'Orchester des Wandels' (Orchestra of Change); as well as a range of events such as talks and screenings (Potsdam Institute for Climate Action Research, n.d.).

In a similar vein, the Institute for Advanced Sustainability Studies Potsdam (IASS) now the Research Institute for Sustainability Helmholtz Centre Pots-

dam (RIFS) is an inter and trans-disciplinary research institute that conducts scientific research on global sustainability with a focus on air quality and climate change, energy transitions, and governance for sustainable development. In 2019 it launched an Artistic Fellowship programme in recognition of "the potential and necessity of collaborations between scientific and artistic knowledge practices towards a common goal of sustainable transformation and transformative sustainability." (Institute for Advanced Sustainability Studies, 2019). The programme facilitated some interaction with policymakers but did not expressly share knowledge outputs with policymakers.

However, the IASS is also linked with the Fonds Ästhetik und Nachhaltigkeit (FÄN) - Fund for Aesthetics and Sustainability (see Section 2.4) and home to the "Art-Science Cooperations for Sustainability" research group, which focuses on "individual and institutional understandings of sustainability, narrative structures of communication in

societal debates, and - as a particular focus since 2021 - on shaping and co-designing (communicative) spaces, processes, tools, insights, and entertainment formats.” (Institute for Advanced Sustainability Studies, 2018). It fosters interdisciplinary collaboration to “explore how policy frameworks could improve our ability to harness the transformation knowledge generated by artists and designers.”[ibid]

As part of the Future City contest, in 2017-18 the the Art-Science Co-operations for Sustainability was selected to work with the German city of Norderstedt to develop measures to help implement a set of sustainability goals as defined by the citizens themselves. At the close of the project, a report outlining key recommendations was published and the results displayed in an exhibition. According to the city of Norderstedt’s website, the resulting concept was “too ambitious” (Stabsstelle Nachhaltiges Norderstedt, n.d.) and it was decided that the focus should be further honed to concentrate on sus-

tainable housing. More research was done on the acceptance and implementation of small apartments/living spaces, and in November 2021 an event will present and garner public feedback on a set of architectural designs for small living spaces.

The Arts Catalyst is a UK-based contemporary arts organisation that commissions artistic projects and research at the intersections of art, science and technology. Arts Catalyst specialises in working in non-traditional art spaces and exploring global challenges, such as the climate crisis and social justice, from interdisciplinary perspectives. They were contracted by the European Space Agency (ESA) in 2005 to carry out a study into “cultural utilisation of the International Space Station (ISS).” In September 2007, the contract was extended to “elaborate and implement some of the policy recommendations from the study, and to undertake some pilot cultural activities, including artist residencies within the Human Spaceflight, Microgravity and Exploration directorate.”(Arts Cata-

lyst, 2009), which led to the ‘Less Remote: The Futures of Space Exploration - An Arts and Humanities Symposium’ at the International Astronautical Congress (2008), which is hosted by the International Astronautical Federation - a space advocacy NGO (Arts Catalyst, 2008).

The Arts Catalyst maintains a critical engagement with policy. For instance, in October 2021, artist duo FRAUD launched a web platform called EURO-VISION, an “artist-led inquiry into the extractive gaze of European institutions and policies, commissioned by Arts Catalyst and Radar.” The multifaceted project, which began in 2018, explores how we can expand the definition of extraction to “encompass policies, international treaties and regulations that impose controversial forms of stewardship of natural resources on communities.” (Arts Catalyst, 2021).

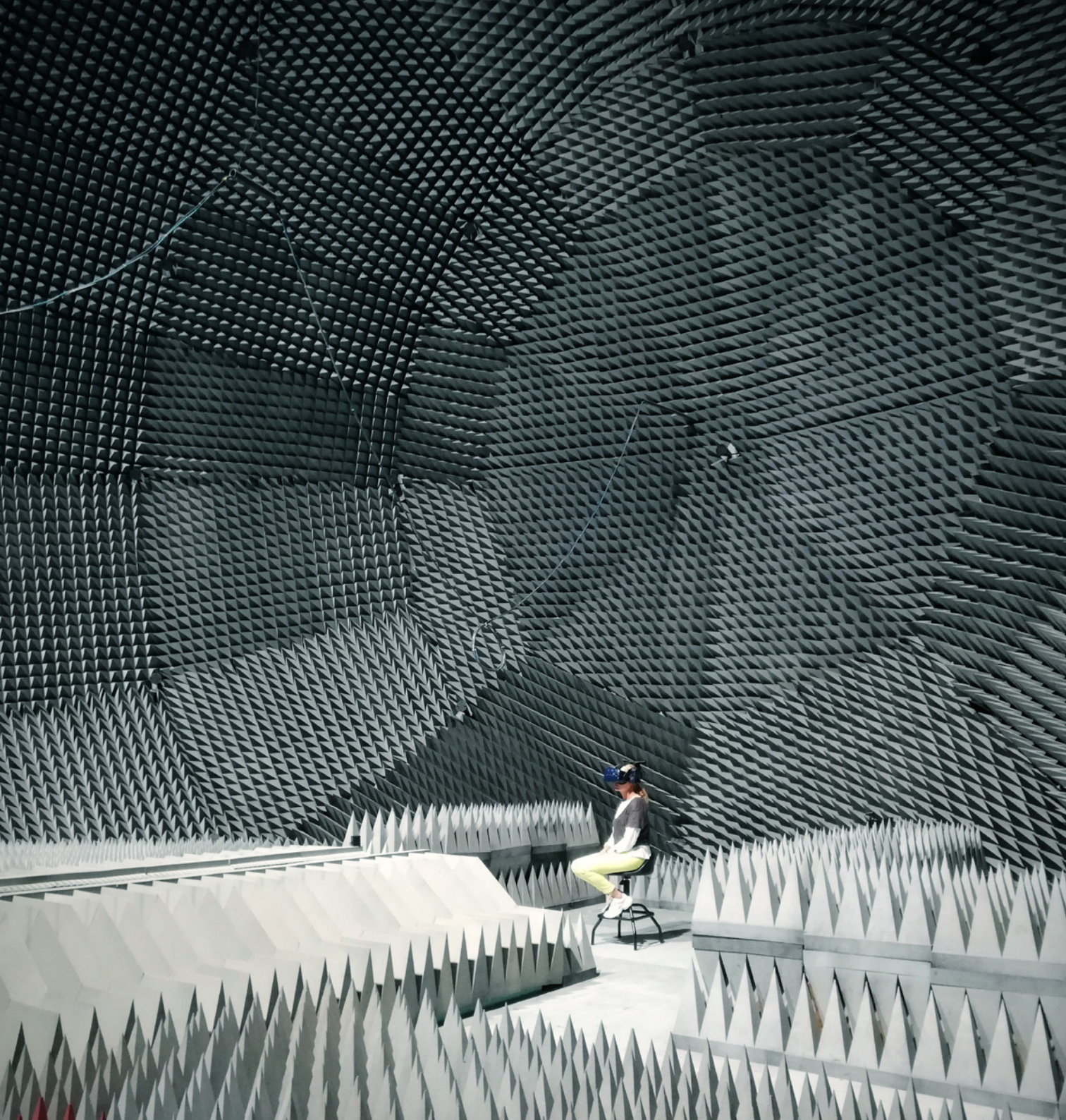
The website presents interdisciplinary research through “video interviews, treaties and documents, as well as a public programme of conversations in the form of podcasts, online workshops, and a series of policy recommendations.”[ibid]

2.2 Active Engagement of Policymakers

Beyond having policymakers as a target audience for written outputs, some SciArt programmes aim for a more active involvement. The form can vary, but this section explores modes by which policymakers are actively involved in projects and outputs, stopping short of policymakers actively collaborating on particular transdisciplinary artistic projects, which is addressed in Section 2.4.

AlanJames Burns, “Silicon Synapse”, 2019.

An immersive Virtual Reality and psycho-acoustic experience that will take you on a simulated journey into the personified mind of ‘Technology’. Listening to the inner dialogue of ‘Technology’s’ mind as it replays both sides of a lovers’ quarrel. Picture taken at the EMSL Electromagnetic Signature Laboratory at the JRC Ispra, 2018. Silicon Synapse was developed during Resonances III, together with Thierry Benoist (JRC), Vasiliki Charisi (JRC), Nicole Dewandre (JRC), Emilia Gómez Gutiérrez (JRC).



2.2.1 Workshops and Events

The Onassis Stegi in Athens is vocal about the need for the cultural sector to commit to sustainability practices. One of the Studiotopia consortium members (see below), Onassis Stegi also recently ran a hybrid Climate Culture festival, 'Climate Culture - The Art of Becoming Sustainable', which engages the cultural sector in conversations about sustainable behaviours, practices and approaches. The programme (Onassis Stegi, n.d.) comprised keynotes and panel discussions by artists, academics, activists, policy makers and cultural practitioners that address themes and topics from an environmental policy perspective, as well as climate justice and how art can help combat the climate crisis - alongside an audiovisual programme of relevant films, and video and sound art.

The Grid is a global interdisciplinary network, an initiative of Open Austria. Open Austria works across four interconnected pillars: Business and Inno-

vation, Tech Diplomacy, Investment, and Art + Tech Lab, which provides a platform for Austria's creative culture and heritage to engage in conversation with the tech innovation culture of Silicon Valley. Alongside the Tech Diplomacy pillar, "the Art + Tech Lab is working with policy makers from Europe and the US to advocate for a new digital humanism in tech." (Chang, 2020). The Grid places artists within R&D teams of tech companies in Silicon Valley, and hosts interdisciplinary talks, workshops and exhibitions to explore topics related to the challenges posed to society and social justice by technology. A highlight in terms of engagement with policy is the annual festival 'The Grid: Exposure - Art + Tech + Policy Days'. Launched in 2020 the festival engages international artists, technologists and policy-makers to leverage the benefits of interdisciplinary approaches and highlight the need for humanism in tech innovation and the digital sphere.

A collaboration between eight European cultural institutions, Studiotopia

comprises a diverse programme of residencies for scientists in artist studios, supported by a European consortium. Outputs include exhibitions, workshops, talks and pop-up labs (“Studiotopea,” 2022). As well as presenting the projects at venues across Europe through talks and exhibitions, Studiotopea has also had a programme of online and on-site workshops to engage members of the public and policymakers in social topics connected with the environmental crisis, such as colonialism, racism and identity – with a view to engendering a more just and shared future. The programme culminated in a travelling exhibition in spring 2022, when the residents’ results, concepts, research material and artworks have been exhibited across Europe.

IIASA is a policy-focused research center, which set up its Science & Art project to with the aim of disseminating key scientific findings to society, and driving “sustainable transformation through active learning and experience” (IIASA, 2020a).

A key theme is having high-profile decision-makers and policy-makers in the audience of (performance) art pieces, which translate scientific understandings and appeal to emotion by describing the human experience in ways that science alone cannot. They have even come up with a formula: “Science + meaning + ethics + engagement = effective transmission of scientific insights to enable action.” (IIASA, 2020b, p 125). One example is the project InDignity (2015), which explored the meaning of dignity through a performance featuring Syrian dancer Hussein Khaddour. It premiered at the Political Symposium of the European Forum Alpbach and was also live-streamed, “High-level decision-makers from the UN and the European Commission were present. That day, hundreds of refugees arrived in Austria, and thousands followed over the following weeks. The audience was very moved; many of them shed tears, and some observed that the performance set the tone for a more honest and critical debate for the remainder of the symposium”

I CAN'T
UNDERSTAND
WHY PEOPLE
ARE FRIGHTENED
OF NEW IDEAS.
I'M FRIGHTENED
OF THE OLD ONES

— JOHN CAGE

A COLLABORATIVE
ON-LINE SPACE IS
ESSENTIAL - A
SUPPORT AREA FOR
SCAFFOLD DESIGN.

DIGITAL &
ANALOG DOMAINS
ARE EQUAL



(IIASA, 2020b, p 20). The report also noted that, “Involving an artist from a war-torn region provided insights from a community whose voice would not have been heard otherwise. Art acted as a medium to connect Syrian civil society with high-level decision-makers—who typically see the conflict through facts and figures—and the general public—who generally learns about the conflict from mainstream media.”(IIASA, 2020b, p 22). The performance was followed by an interactive session that engaged the audience and explored the interplay between conflict and cooperation, leading to a better understanding of the issues and “support of complex decision-making.”(IIASA, 2020b, p 45). The connection to science is framed as follows: ““The Sustainable Development Goals, extensively informed by science, provide a direction for the world, with the ultimate aim of ensuring ‘life in dignity for every person on the planet.’ But what does life in dignity actually mean?

Before engaging with science directly, the first Science & Art project, developed in 2015, sought to contribute to the sustainability agenda-in-the-making by examining the meaning of dignity” (IIASA, 2020b, p 125).

The interactive performance art piece, called ‘Migraspectives’ was shown as part of a 2018 joint initiative by the IIASA and the JRC to “explore how to optimize the use of scientific evidence in policy-making”(IIASA, 2020b, p 63). The audience consisted of researchers and policymakers from 40 nations participating in a summer school on Evidence and Policy Making. The performance was designed to make tangible the cultural theory of risk and the idea that different worldviews must be taken into account to find a sustainable solution to migration - in this case a “boat” of migrants seeking somewhere to dock in Europe. The audience was asked to divide up into one of three “worldviews”

Roberto Paci Dalò, “eBAU”, 2022.

A vision of the New European Bauhaus developed as part of the JRC SciArt project “SciArt & the New European Bauhaus”. First showcased at the JRC SciArt Summer School 2022, Ispra (Italy).

- individualist, hierarchist, egalitarian - that most represented their own, and asked to suggest long-term solutions. The MC then has representative groups from each larger group come together to search for a solution, and then the best inclusive solution is finally agreed on. “Only one of more than a hundred participants joined the migrants for some time. This confirmed a consistently observed real-world pattern where policymakers discuss solutions without consulting with the impacted communities,” (IIASA, 2020b, p70) notes the report’s author and the project’s co-lead, Gloria Benedikt.

2.2.2 Prizes

Perhaps the most influential in the field, the S+T+ARTS Prize is an element of the S+T+ARTS initiative. This annual competition recognises pioneering projects that “make a significant impact on social and economic innovation.” Two prizewinners are given €20,000 each and prominent exposure at Ars Electronica, as well as at other events hosted by consortium partners (BOZAR, Waag, INOVA+, T6 Ecosystems, French Tech Grande Provence and Frankfurter Buchmesse).

Each year since 2016, two grand prizes and 10 honorary mentions have been awarded to interdisciplinary projects that have the potential to significantly impact economic and social innovation. The S+T+ARTS initiative in general gives rise to many policy briefs, with the S+T+ARTS Prize (Ars Electronica, n.d.) an element of showcasing the potential for impact of interdisciplinary projects. Some of the projects explicitly intersect with policy. For instance, in 2021, an honorary mention was given to Fo-

rensic Architecture (FA) for their 'Cloud Studies' project, which uses techniques like digital modelling, machine learning, fluid dynamics and mathematical simulation to analyse what they call "airbourne violence", or the use of toxic gases on citizens, often in the context of protest or migration. In 2019, FA received an honorary mention for 'The Murder of Pavlos Fyssas', which created a reconstruction of events to provide evidence in the court case against members of Greece's neo-Nazi group Golden Dawn - of which 15 members were ultimately convicted.

Also in 2019, 'Ciutat Vella's Land-use Plan' received the Grand Prize - Innovative Collaboration, which recognises pioneering partnerships between tech, industry and the arts. Created by a team of "urban planners, lawyers, political leaders, researchers and citizen participation facilitators for the city of Barcelona (?)," the project directly involves municipal authorities. It uses both big data and qualitative data (from citizen participation), processed

with the help of machine learning and AI, to simulate and propose public policy that preserves and enhances the livability of the urban quarter. The resulting 'data atlas' not only describes the urban fabric and its use by citizens, but also shows the impacts of the urban landscape on human health (for example through noise and air pollution). A 2020 nomination 'Be Water by Hong Kongers' recognises the innovative and creative ways that protesters in Hong Kong used digital technologies - from protest art to social media, online forums to livestreaming - to "be water" (a quote from martial artist Bruce Lee), adapting fluidly to a dynamic and often dangerous situation. 'Perception iO' received an honorary mention in 2020 for an immersive experience that uses tech tools currently in development for law enforcement to demonstrate how racism and other biases can be encoded into artificial intelligence, and the ways in which this is dangerous for society.

Connecting artists to the work of CERN's scientists, the Arts @ CERN in-

initiative is one of the longest standing European international artist residency programmes, established in 2011 as Collide@CERN (CERN, n.d.). The programme comprises research-led artistic residencies (onsite or remote), art commissions that explore the interdisciplinary exchanges, and a programme of public exhibitions and events. While predominantly focussed on the intersection between art and science, between 2019 and 2021, Barcelona City Council partnered with CERN on the Collide Prize, which offers an artist residency at CERN as well as at a selected leading creative hub in Barcelona. This collaboration is part of an initiative by the city of Barcelona to develop its own science policy. According to the Barcelona Science Plan 2020-2023, “What is needed is a science policy linked with the policies that have been developed for culture and education in a manner

that multiplies the potential of each of these policies individually, in order to establish a powerful platform for dissemination and experimentation that will allow for a discussion about citizen science and the promotion of knowledge to all ages. A policy that links and generates complicity with the policies concerning economic and social innovation, job creation, mobility and aging. A science policy that benefits from the potential brought about by the multiple approaches of the exact, experimental and technological sciences, the life and health sciences and the social sciences and humanities.” (City of Barcelona, p3). The collaboration with CERN in particular addresses priority area #4 of the plan: “Incentivise the creative link between art, science and technology, stimulating the co-creation and exchange of scientific knowledge between the social and economic actors

Siobhán McDonald,

“Connected by Air. Eyjafallajökull 2010 eruption”,

Glass prism, volcanic ash, air particles, 24 karat gold, solid silver, smoke, plinth and film projection. 2 minutes, 20 seconds. The work takes as its subject the delicate ecologies and co-existence between the lungs of the earth, humans and plants. The project explores a selection of major European volcanoes and points to the cycle of the earth breathing within the carbon cycle of our ecosystems. This work was developed during Resonances III in collaboration Francesco

Mugnai and Jean-Philippe Putaud and premiered at the exhibition *Datami* at BOZAR, Brussels, in 2020.



of the city; and consolidate the relationships between the science sector's innovation facilities in the city and metropolitan region" (City of Barcelona, p5).

Additionally, The Grid (see Section 2.2.1) gives out 'eVe', an annual award recognising artworks that give new meaning to technologies by repurposing them - opening up new perspectives and highlighting tech's hidden powers, as well as its potential drawbacks. The COAL Prize acts in a similar way for art related to sustainability. Administered by COAL, the Coalition for Art and Sustainable Development, the aim of the prize and organisation is to promote the emergence of a culture of ecology. COAL actively cooperates with French ministries of Environment and of Culture, through European cooperation (as the French representative of Imagine2020 and Creative Climate Leadership networks) (COAL, n.d.).

2.2.3 Adoption and Integration

The Fund for Aesthetics and Sustainability (FÄN) is a proposed nationwide funding instrument and platform to enable artists to get involved in long-term collaborations with scientists and citizens for sustainability-oriented transformations (Erbach, 2021). It was launched by the IASS in collaboration with affiliate scholar and ex-member of the Berlin Senate, Adrienne Goehler. The concept proposes an alternative to the 'throwaway logic' of traditional funding streams, allowing longer-lasting formats for artistic projects and collaborations, and calls for funding structures that better support interdisciplinary collaboration between the arts and sciences. The idea of a FÄN made it into the Greens' 2021 election manifesto (Knöfel, 2021). FÄN has created a one-pager for the coalition negotiations (FÄN, n.d.).

FÄN was also mentioned in a recent report on implementing policies for sustainability by the Sustainable Development Solutions Network (SDSN) Germany, which sits at the interface of science and policy (SDSN Germany, 2021).

2.3 Critical Engagement with Policy and Society

BioArt Society is a Finnish artist association that creates and facilitates interdisciplinary art-science collaboration with a focus on biology, ecology and the life sciences. In 2020 the SOLU space was opened, following four years of planning and development. In this Helsinki space they host exhibitions and workshops. According to the BioArt Society's 2020 annual report, in parallel, "the transdisciplinary art&science field was receiving continuous and increasing attention in Finland and internationally" (SOLU, 2021). They also note that the financial plan for the space is both feasible and sustainable [ibid]. They run two regular residencies: Ars Bioarctica, an art-science initiative launched in 2008 and focused on the sub-arctic environment; and Field_Notes, a week-long, interdisciplinary field lab at Kilpisjärvi Biological Station in Lapland. BioArt Society participated in four Creative Europe-funded projects recently [ibid]: Feral Labs, a series of camps and other temporary creative environments

that take place across six EU countries, with a focus on research, community connection and co-creation. Of particular interest to the art-science-policy nexus is BioFriction, a research project that opens up space for transdisciplinary exchange to address alternatives to challenges in Europe "such as the rise of essentialist discourses... [and] policies of marginalisation and exclusion". BioArt Society was also part of ART4MED, a series of residencies, workshops and talks exploring how art can address complex issues around health and medicine and ArchIVE, an open-source digital platform to document bioart practices.

2.4 Collaboration with Policymakers

Collaboration with policymakers is the most active form of engagement of SciArt activities with policy. These activities have a degree of active engagement between policymakers and SciArt practitioners. Yet, there is still variety in the depth of involvement.

At the lighter end of collaboration are the activities of TBA21 Academy. This contemporary art organisation (non-profit) aims to “foster a deeper relationship to the ocean,” (TBA21, n.d.) initiating and facilitating collaborative, interdisciplinary research and artistic projects - and hosting exhibitions and educational events for nearly a decade. In 2019, the Academy opened a physical venue in Venice called Ocean Space alongside a digital platform, Ocean

Archive. In 2020 the Ocean Fellowship Program. TBA21–Academy states that it “has grown an extensive network of ocean practitioners and experts from the fields of science, policy, law, big data, feminist, and indigenous scholarship.”(e-flux Institutions, n.d.)

The Academy explicitly engages policy-makers in its projects, and lists “policy interventions” (TBA21, n.d.) as one of its main outcomes alongside exhibitions and research. The Digital Archive, for example, “translates current knowledge about the Ocean into a shared language that enables us to make better decisions for urgently needed policies.”[ibid]. With the University of the West Indies, it developed the Alligator Head Marine Lab, “which resulted in the establishment of the largest privately backed fish sanctuary in Jamaica.”[ibid] Ocean Space programming includes a

Nonhuman Nonsense,
“Pink Chicken Project”, 2022.

Picture taken during the JRC SciArt Summer School on NaturArchy (Ispra, Italy) in June 2022. The pink chicken project is a speculative suggestion, that provokes thought around the intimate link between social and ecological justice, and allows us to think about the impact of novel biotechnologies from multiple ethical and political perspectives: why should we seek/avoid this future? How does the violence of entire-species genetic modification compare to the violence already inflicted on billions of chickens in factory farms? How can we have ethical relationships with other species in a shifting landscape of human-nonhuman power?



diverse range of public-facing events “relating to subjects—economic policy, legal maneuvering, environmental action—not typically engaged in museums or cultural spaces.” (Battaglia, 2019) It’s a community member of the EU’s Maritime Forum (European Commission, n.d.), a communication platform for EU maritime policy stakeholders.

Waag is an interdisciplinary organisation that collaborates with policy on multiple policy objects. The organisation engages a “trans-disciplinary team of designers, artists and scientists, utilising public research methods in the realms of technology and society.” The goal is to empower “as many people as possible to design an open, honest and inclusive future” (Waag, n.d.). R&D activities take place in research labs and focus on technological and social issues. The Waag also hosts public workshops, exhibitions and debates, as well as educational courses on creative technology and society through the Waag Academy programme. In 2021,

Waag was named by the Minister of Education, Culture and Science as a Future Lab, which is defined as “a centre for the future-oriented development of design and for the use of design and technology to solve social challenges.” [ibid] Structurally, Waag differs from many of the other initiatives detailed here because rather than focussing on specific projects, the organisation rather acts as a body engaging across disciplines and vocational designations leveraging, for and with policy, knowledge from both within the organisation and through shorter-term engagement with other stakeholders.

S+T+ARTS activities span the entire range of the aforementioned types of intersection with policy, but of particular note are their recent residency programmes, which introduce artists to scientists and local government as well as cultural and tech organisations, and the S+T+ARTS Regional Centres, which aim to expand activities on a local level. S+T+ARTS is a European Commission initiative, launched under

the Horizon 2020 research and innovation programme. “implemented by European policy to promote innovations that also benefit the art world.”(Ars Electronica, 2021b). The programme supports interdisciplinary collaboration “to develop more creative, inclusive and sustainable technologies, and focuses on people and projects that help address [Europe’s] social, environmental and economic challenges” [ibid].

The first residency project, Vertigo (2016) implemented a total of 45 residencies (by May 2020). The WearSustain project (2017 to 2019) facilitated international, interdisciplinary collaboration on the theme of smart fashion and wearables, funding 46 projects overall. Re-Fream (2019 to 2021) reimagined the future of fashion through 20 collaborations between artists, designers and tech providers. The Mind-Spaces project (2019 to 2021) is supporting six artists to develop three pilot use cases for making workplaces, interiors and the urban environment “more dynamic, inclusive and functionally and

emotionally appealing” (Ars Electronica, 2022a).

The pilot edition of S+T+ARTS Regional Centres (June 2019 – December 2020) included seven institutions across Europe. The next round (March 2020 – June 2021), subtitled “Towards Sustainability”, included eight institutions and the current programme, “Repairing the Present” (June 2021 – December 2021), includes 12 institutions (Ars Electronica, 2022b). The institutions involved are predominantly cultural institutions alongside some research institutions.

Alongside collaboration with policy-makers during residency programmes, these activities have had concrete impacts on policy. In its European Agenda for Culture from May 2018, the European Commission proposed “a series of commitments that echo the main suggestions raised by S+T+ARTS partners during this project:

1. Support partnerships between creative professionals and industries and

European incubation networks for creativity-driven innovation integrating creativity, art and design with cutting-edge technology and science.

2. Explore a European Institute on Innovation and Technology Knowledge and Innovation Community on cultural heritage and creative industries.

3. Organise a regular dialogue with cultural and creative sectors in the context of the renewed Industrial Policy Strategy, to identify policy needs and underpin a comprehensive policy framework at EU level.” (Stocker et al., 2020)

As part of “Repairing the Present through Art-Driven Innovation”, STATE Studio is hosting a residency focused on Berlin’s future mobility as a collective mission? (STATE Studio, 2022). The Local Expert Group (LEG) includes Perttu Ratilainen, who is co-CEO of Reallabor Radbahn, a project funded by the Federal Government and the Senate of Berlin which will see a 9-km path under the U1 tracks transformed into a high-speed cycle lane. The LEG also includes Burkhard Horn, a freelance



consultant working with city administrations on mobility (Senatsverwaltung für Stadtentwicklung, Bauen und Wohnen, 2019).

The STARTS4Water programme similarly teams artists up with local organisations and in some cases administrations to address local topics relating to sustainability: The Zero Pollution Adriatic challenge, hosted by the UR Institute includes support from multiple policymakers in Dubrovnik (UR Institute, 2021), and Cistern Knows, hosted by Ohi Pezoume / urban dig project includes support from Environmental Association of the Municipality of Sifnos, Greece and Water Directorate of Decentralised Administration of Attica (Ars Electronica, 2021).

Though rarely found in the research for this scoping study, there is an example

of a bottom-up art-science-community project becoming actively involved with policymakers. CoDesRes is a project based on a methodology called the permaCultural resilience (pCr) framework, which takes social and environmental justice into account in the research and creative process. “The pCr praxis uses innovative systemic methods and long-standing knowledge networks to engage with circular economies, self-organisation and a re-imagining of local possibilities” (McKeown, 2020). CoDesRes is funded and administered by Ireland’s EPA and is working on circular solutions for fishing nets, focusing on every stage of the product cycle. It is based on the pCr methodology, initially developed by Anita McKeown through artistic practice, which has a strong focus on co-creation and community outreach (CoDesRes, 2019). Between 2018 and 2020, the CoDesRes project also

Frederik De Wilde, Hyperthinker #1, 2017.

Artwork developed in collaboration with the philosopher Nicole Dewandre (JRC). Rodin’s iconic sculpture *The Thinker*, was first conceived in the late 19C. But what is *The Thinker* thinking NOW? How would a 21st Century Thinker look, feel and think like? Frederik’s 3D sculpture of a man - this time with an augmented brain - is inspired by Rodin’s work and asks: what is the impact of technology and automation in our society, on the role of philosophy and ethics? By the use of a signal blocker, the work forces one to be digitally disconnected. *HyperThinker #1* may trigger thoughts of those who live without the internet. How fair is that?

embedded an interdisciplinary team in a secondary-level school (Transition Year) to develop curriculum resources around the SDGs - especially #4: Quality Education. The curriculum resources include introducing the SGDs, and providing activities, lesson plans and links to resources (CoDesRes, 2020). The results of the initiative were presented to the Green Party Education Policy Working Group (McKeown and White, 2021).

The most involved collaboration, however, is exemplified by the JRC's flagship sci-art artist residency, which embeds artists in a JRC project team with the aim of creating an original work that elucidates the science project. The JRC also runs a SciArt Summer School, which unites scientists, artists and policy-makers to prepare for the Resonances Festival, which presents works "developed for the occasion and based on JRC scientific results" (Eeckels, 2017, p 31).

"The unique principle of the Resonances Festival is to have scientists, artists

and policy makers meet in brainstorming sessions, with the objective of conceiving jointly works of art – classical works of painting and sculpture, but also installations, performances, video-art, etc. – inspired by science, on a theme chosen by the JRC. The artist retains the last word on the work s/he will create, but the uniqueness of the formula lies in the exchange with the scientist and/or policy maker... This concept is unmatched in the art/science world: inviting all participants to meet and cross the borders of their disciplines, creating a place and moment where scientists and artists can meet to get inspired by their encounter and conceive novel works of art is, indeed, a unique approach"(Eeckels, 2017, p 28).

The first Resonances Festival took place in 2015 at the Milan Expo. It featured an exhibition of works on the theme of *food*, as well as a children's theatre workshop and talks by and among policy-makers and experts - meeting the goal to spark "a dialogue between scientists, policy makers and artists by

Honey & Bunny,
"Sustainable Food Design", 2017.



bringing them together in one room and discuss[ing] one theme from various points of view” (Eeckels, 2017, p 12).

After this festival, “the JRC launched the ‘SciArt Project’ with the intention of investigating the integration of art in its research and work methods” (Eeckels, 2017, p 2). So in 2016, a Summer School took place, which was followed by a SciArt Workshop that brought together JRC scientists, policy-makers and artists from across Europe to discuss and create works on the theme of *fairness*. A resulting report, published in 2017, addresses the issue from the perspective of economics and opportunities, and offers insights into how fairness is perceived across the continent. In particular, it reflects on the question of “How can our political leaders fashion a set of policies which will deliver a society in which a sufficient number of people at least believe, to be sufficiently fair?” (European Commission. Joint Research Centre., 2017a). There was also a public exhibition held at Milan’s

Leonardo da Vinci National Museum of Science and Technology.

Resonances III focused on the topics of Big Data, AI and the digital transformation. In 2018, it brought together scientists, artists and policy-makers for the Summer School and resulting festival. The project was entitled DATAMI, and the public exhibition took place in October 2019 at Lake Maggiore in Italy. The festival “celebrates not only [the participants’] work, but the work of all JRC staff in their mission to develop sound science in support of policymaking of the European Commission” (“Resonances III Festival: Datami, the exhibition, Ispra,” 2019). As well as displaying the works created, the festival also hosted a series of talks and workshops to engage EU citizens in policy topics and processes of policy-making.

Although not emerging from the Resonances project, the Urban Water Atlas for Europe (2017) was “the first major publication of the Science and Knowledge Service of the European Commis-

sion, the JRC, which within a movement stemming from its Sci-Art Programme seeks to explore the important opportunities arising from the cross-fertilisation between science and art” (Gawlik et al., 2018). The Atlas illustrates how water flows through cities, using texts, photographs and artworks. It also provides tools, references and resources for various municipalities to apply local solutions to water challenges. “Yet, the true value of this publication lies in the process of ensuring that the underlying scientific knowledge is available for societal uptake.”[ibid] The Atlas is designed to complement the ‘Blueprint to Safeguard Europe’s Water’, the EU’s policy response to the region’s vast and interconnected water challenges “by providing extensive information on the current water situation in many European cities and highlighting the central importance of cities in achieving the policy objectives.” (European Commission. Joint Research Centre., 2017b, p 15). Through the concept of “Sci-Art Water Diplomacy,” (European Commission. Joint Research Centre., 2017b, p

14), the idea is that it unites stakeholders by introducing “the emotional aspects of water – as seen through the eyes of children and artists” (European Commission. Joint Research Centre., 2017b, p 162).

According to the JRC’s SciArt strategy report, “The JRC’s work in research and policy making can be enriched by involving artists in various manners: 1. By creating instances of co-creating works of art with scientists, policy makers and artists, as in the current Resonances Festival format; 2. By embedding artists within the JRC for short periods, within a coherent and well- thought-out scheme of collaboration between the artists and scientific projects 3. By investigating novelties in the application of design methods, scientific publications and by disseminating recent epistemological developments” (Eeckels, 2017, p 6).



3. Conclusions

There are multiple forms occurring at the intersection of art, science and policy in Europe, ranging from one-off and transitory engagement of policymakers as audience-members, through reports and critical participatory engagement to collaboration between practitioners of the three fields. From the initial scoping study, a first typology has been posited, based on the direction of knowledge transfer from these projects and taking into consideration the degree to which policymakers are actively working with art-science practitioners.

Outcomes from art-science programmes and projects reach policymakers as an audience, frequently through the production of policy briefings and reports. What is not clear without further study is, how much of the impact on policy is in terms of topic-related content - be that sustainability, innovation or social change - and how much is in terms of encouraging support for more inter- and transdisciplinary projects.

While there are many examples of policymakers and policy being the intended recipient of knowledge coming from art-science projects, examples of active participation on the part of policymakers are still scarce. The S+T+ARTS ecosystem presents diverse forms through which art, science and technology coincide, and in some cases also include active interaction with policy. In these latter cases, such as the S4W and Repairing the Present residencies, the artist applies with a pre-existing idea to an already selected suite of stakeholders, the Local Expert Groups which are chosen in advance of the artistic project being chosen. These stake-

Anne Marie Maes, detail from "Sensorial Skin for an Intelligent Guerrilla Beehive", 2017.

Artwork developed during Resonances II, in collaboration with biocomputationist Núria Condé Pueyo (JRC), toxicologist Laura Gribaldo (JRC) and media specialist Paulo Rosa (JRC). A bio installation (a sculpture constructed from organic materials and using open source digital fabrication methods such as 3D printing) which provides viewers an artistic visual and audio experience of activities in and around a beehive.

holders join into the project based on the artist's initial idea and have more or less engagement depending on their interest and how they fit into the project.

The S+T+ARTS residencies have woven into their structure a hierarchy, which positions the artist as initiator of the idea, and the rest of the stakeholders as experts, who have a different stake in the project outcome. Even more rare are opportunities where policymakers actively participate in a project or programme in which pre-existing hierarchies and constraints on possibilities for collaboration – for instance competing responsibilities, time commitments and lack of explicit funds – are actively addressed. Progress that has been made in this regard for art-science intersections, such as active funding programmes and research into the outcomes of different types of programme structuring, can provide valuable guidance on how to extend these practices to policymakers as potential collaborators. In these terms, the JRC's

SciArt programme is an example of an art-science-policy intersection explicitly established to have a flatter hierarchy, a “democracy of disciplines” (European Commission. Joint Research Centre, 2017a, p 7). The success of such efforts depends not only on their structure and excellent facilitation, however, but also on the individuals taking part.

Throughout the research it has emerged that the direct impact of action at the art-science-policy intersection on policy is harder to track than the initiatives themselves; often the routes by which knowledge is transferred out of art-science-policy interactions (and art-science into policy) are through individuals acting as vectors within an ecosystem, rather than following a paper trail. This is a known problem also for addressing the impact of art-science and even art itself (Hlavajova et al., 2008; Vaage, 2020), as the action of these projects are often necessarily not - indeed cannot be - defined in terms of milestones

and KPIs. Even their knowledge products can be hard to pin-down using standard evaluation methodologies, and longitudinal action on values, ideas and priorities are rarely evaluated (Muller et al., 2020). This is all the more difficult when outcomes are either not published in the public realm, or are not findable.

is important to understand better the modes of interaction between actors in this nexus. Therefore, it is crucial that further study is undertaken to identify the efficacy of different ways of engaging with policy and its impact on both policymaking, funding priorities and action at a local, national and international level.

Yet when we look at the impact of the FET-ART programme from 2014 (Torrenti, 2014), we see that initiatives embedded within existing policy organisations have an effect on future strategic priorities and funding possibilities - ie: the type of projects that can be made - and have the possibility also to affect decisions on future policy priorities. It's also clear that these projects can and do feed into innovation relevant to sustainability challenges.

The art-science-policy nexus is a potent landscape in which crucial ideas for a sustainable future can foment. To make the most of this opportunity, it



4. Recommendations

Following this scoping study, the following steps are recommended to more fully understand the art-science-policy landscape, and in particular its agency in addressing societal challenges such as sustainability and priorities of the European Green Deal.

In terms of further research, promising and important topics include:

- A structured exploration of the themes that are explored at the art-science-policy nexus
- A study into the impact of art-science on policy, with a focus on scale, longevity and, most importantly, content. Given the current research landscape in this regard, a further recommendation is to carry out ethnographic and longitudinal research in conjunction with interviews, site visits, exhibition and literature research. Crucial is that multiple forms of output are considered as possessing the potential to create impact – such as exhibitions, artworks, temporary experiences, conversation.
- In conjunction, it is recommended to undertake a study tracing the flow of ideas, including the iterative cycle between cultural trends and funding trends.
- Research into the stated and implicit theory of change under which art-science projects interact with policy.
- Research into the intersection of art and science with activism, and historical perspectives on the transition from activism to policymaking and politics.

Autogena & Portway,

Weather Prediction by Numerical Process, 2018.

Artwork developed throughout Resonances III in collaboration with Jutta Thielen-del Pozo (JRC), Florian Pappenberger (ECMWF), and Peter Lynch (School of Mathematics and Statistics, University College Dublin). A participatory performance where people would calculate collaboratively a weather forecast through human labour, thus turning the act of calculating the computation into a social action.

In light of the outcomes of the above research, a valuable next step would be to explore whether it is possible to develop a framework, or frameworks, for assessing art-science and art-science-policy projects without at the same time introducing constraints that fundamentally damage or destroy the undertaking.

In order to facilitate the understanding of the art-science-policy landscape, it is recommended that structural and organisational processes are in place to ensure that much of the valuable learning is shared widely. These include:

- Creation of a repository of policy briefings that come from art-science projects
- Establish an analogue of FAIR principles for interdisciplinary project outcomes. FAIR proposes that data be published so that it is Findable, Accessible, Interoperable and Reusable. An analogue for art-science-project outcomes would be creating standards for meta-data, ensuring open access publishing, creating guidelines for documentation and supporting the adoption of Creative Commons licensing where appropriate.
- Establishment of an Open Access Publishing Fund for Art and Science

RADIO FRANKENSTEIN, 2016,
written and directed by Markus Zohner
Theatre performance developed during
Resonances II on the topic of Fairness



Art-science programmes and their relation to policymaking

- **Sharing results** Sharing Knowledge Outputs: policymakers as target audience for written outputs
 - **Engagement** Active Engagement of Policymaker
 - **Collaboration** Collaboration with policymakers
 - **Critical** Critical engagement with policy
- * a S+T+ARTS funded project

Programme	Country	Description	Level of interaction with policy	Details of interaction with policy	engaging policymaking since
S+T+ARTS	EU	A platform & funding programme for science, technology and the arts of the European Commission	Sharing results	Production of policy briefing. It provides concrete impact on policy through workshops and events, recommendations, briefings, partnerships, and networks.	2016
S+T+ARTS Prize	EU	Prize awarded to interdisciplinary projects with economic and social innovation impact. Established in 2016.	Engagement	Gives rise to many policy briefs. Some projects explicitly intersect with policy (eg. Forensic Architecture 2019; Citutat Vella Land Use Plan' 2019).	2019
S+T+ARTS Regional Centres	EU	S+T+ARTS programme that introduces artist and scientist to local government	Collaboration	Aims to expand activities on a local level, inviting local governments to fund art-science initiatives. Here, policymakers collaborate with artists and scientists already throughout the residencies	2021
STARTS4Water	EU	Fosters interdisciplinary projects to respond to regional water-related challenges	Collaboration	Teams up artists-scientists with administrators to address local topics relating to sustainability	2021- 22
FET-ART	EU	EU funded project (2012-2014) that connected European ICT and Art communities to identify new research avenues, challenges, and expected impact	Sharing results	Consultation techniques, collaboration and mentoring methodologies. Policy recommendations at the end of programme	2012-14
PIK	DE	Public Institution for Climate Impact Research offering artist residencies since 2011	Sharing results	Has initiated multiple activities that communicate to policymakers and the general public, including a series of conferences, communication of climate science through audiovisual media, arts collaborations, and events such as talks and screenings.	2011
IASS (now RIFS)	DE	Public Research Institute for Sustainability	Sharing results	Develops research on public and private perceptions of sustainability, whilst including the arts and creative practices as actors within the eco-system. Facilitates interaction with policymakers.	2019
FAEN	DE	Public Fund for Aesthetics and Sustainability	Sharing results	Fosters interdisciplinary collaboration with the arts to „explore how policy frameworks could improve our ability to harness the transformation knowledge generated by artists and designers“.	2021
FAEN	DE	Public Fund for Aesthetics and Sustainability	Engagement	Explores how policy frameworks could improve our ability to harness the transformation knowledge generated by artists and designers	2021
ARTS CATALYST	UK	Visual arts organisation and charity established in 1993	Sharing results	In 2005 Arts Catalyst was commissioned the elaboration and implementation of policy recommendations related to cultural utilisation of ESA's International Space Station. Maintains critical engagement with policy by expanding policies, international treaties and regulations.	2005
Onassis Stegi	GR	Cultural hub of the Onassis foundation established in 2010. It brings together contemporary culture, aesthetics and science.	Engagement	Engages policymakers in art-science through S+T+ARTS related workshops and events on sustainability related issues*	2010
The grid	AT/USA	The Grid is a global art + tech + policy network.	Engagement	Includes art-thinking in technology and policy spheres to impact on rules, regulation and anticipation strategies.	2019
The grid - eVe	AT/USA	eVe is an annual award celebrating collaborative artworks around technology and industry.	Engagement	Includes art-thinking in technology and policy spheres to impact on rules, regulation and anticipation strategies.	2021

The Grid: Exposure - Art+Tech+Policy Days	AT/USA	An annual festival including art, talks, workshops and panels taking place in San Francisco.	Engagement	Through art, talks, workshops and panel, the festival „Exposure“ engages international artists, technologists and policy-makers to leverage the benefits of interdisciplinary approaches and highlight the need for humanism in tech innovation and the digital sphere.	2020
Studiotopia	EU	A art-science project running between 2019 -2022, supported by eight European cultural institutions and funded by Creative Europe	Engagement	Cultural policymakers are involved in the Studiotopia workshops and events. The project seeks to inspire transdisciplinary innovation by addressing the ecological implications of the Anthropocene.	2019
IIASA	AT	International research institute that advances systems analysis and applies its research methods to identify policy solutions	Engagement	IIASA established a science-art project in 2020. The project brings high-profile decision makers and policy makers amongst the audience of performance-art pieces.	2020
Collide Prize , Arts@CERN	EU, SP	Arts@CERN is the art-science programme of the European Organization for Nuclear Research. Collide is a residency programme of Arts@CERN, established in 2012 to foster networks with international organisation. Collide Prize is an annual competition allowing artists a residency period of 2 months at CERN and the partner institution/city.	Engagement	In 2019 a new residency programme was established between Arts@CERN and Barcelona as an initiative of the city to develop its own science policy. Artists would spend time at CERN and in one of Barcelona’s creative hubs.	2019
COAL Prize	FR	COAL is an association that mobilises artists and cultural actors on societal and environmental issues. Established in 2008, it promotes the emergence of a culture of ecology.	Engagement	The COAL Prize aims to highlight to the general public and political actors these other ways of understanding the complexity of the climate and ecological challenge through a multiplicity of views and creative alternatives	2010
Bioart society	FI	Association that develops, produces and facilitates activities around art and natural sciences with an emphasis on biology, ecology and life sciences.	Critical	Takes a critical perspective on policies and social challenges rather than collaborating with policy-makers	2008
TBA21	SP/AT	Contemporary art organization and cultural ecosystem founded in 2002. It comprises an Academy, an Ocean Space and an Ocean Archive.	Collaboration	TBA21 Academy explicitly engages policymakers in its projects, and lists policy interventions. The Ocean Archive „translates current knowledge about the ocean into a shared language that enables us to make better decisions for urgently needed policies“. The Ocean Space is both an exhibition and research space dedicated to the activities developed by TBA21 on Oceans, Art and Sustainability. TBA21 is a community member of EU’s Maritime Forum, and a communication platform for EU maritime policy stakeholders.	2011
WAAG	NL	Dutch foundation founded in 1994, that reinforces critical reflection on technology, develops technological and social design skills, and encourages social innovation.	Collaboration	Has collaborated with policy on multiple policy objects. It acts as a body engaging across disciplines and vocational designations leveraging, for and with policy, knowledge from both within the organisation and through shorter term engagement with other stakeholders.	1994
STATE Studio	DE	Creative hub established in 2014, that bridges the gap between science, art, and society with the aim of making science accessible and facilitate creativity without borders.	Collaboration	As part of the S+T+ARTS initiative „Repairing the Present through Art-driven Innovation“, STATE Studio engaged artists-in-residence with local policymakers on the topic of Berlin’s future mobility.	2021
CoDeRes	IRE	A United Nations Sustainable Development Goals projects funded by the Environmental Protection Agency.	Collaboration	CoDeRes is a bottom up art-sci-community project becoming actively involved with policymakers. CoDesRes brings together artists, scholars, engineers and marine biologists to co-design and co-develop a multi-stakeholder approach for a ‘beyond-compliance’ engagement with the Sustainable Development Goals 4, Education; 11, Sustainable Cities And Communities; 14. Life Below Water and 15, Life On Land.	2018-20
JRC SciArt project	EU	An art-science project of the Joint Research Centre of the European Commission	Collaboration	The SciArt project involves European Commission policymakers in the co-creation process from the start of the art-science collaborations. The JRC develops science in support of policies, and artists-in-residence at the JRC are thus fully immersed in the policymaking cycle and issues relating to science and society.	2016

About the Author

Kat Austen is a person. In her artistic practice, she focusses on environmental issues, melding disciplines and media to make sculptural and new media installations, performances and participatory work. She is a Fellow of the Royal Society of Arts and an expert in interdisciplinary practice.

Austen's practice is underpinned by extensive research and theory, and driven by a motivation to explore how to move towards a more socially and environmentally just future. She is Artist in Residence at the Faculty of Maths and Physical Sciences, University College London and Senior Teaching Fellow at UCL Arts and Sciences. She has held numerous residencies and fellowships including EMAP / EMARE Artist in Residence at WRO Art Center 2020 and Artist Fellow at Institute for Advanced Sustainability Studies, Potsdam, 2020.

Austen has exhibited at Changwon Sculpture Biennale, Republic of Korea; Bonhams Art Gallery, UK; The Polar Museum, UK; Contemporary Museum, Wrocław, Poland; Bozar Centre for Fine Arts, Belgium among others, and her work is held internationally in public and private collections. She has performed around the globe, including at Opera North, Leeds; Fusion Festival, Berlin, Ars Electronica Festival, Linz and Headlands Center for the Arts, San Francisco.

Declaration of Interest

The author is a practicing artist in the field of art-science and policy. She has participated in a number of the programmes and worked with many of the organisations discussed in this report including but not limited to STUDIOTOPIA and S+T+ARTS Repairing the Present. This report was commissioned by the JRC.

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