



H2020-Grant Agreement 787289



GRECO

Putting Open Science into action: Public engagement and Citizen science

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Madrid, 29th November 2019
@ Let's do it together workshop
ETSI- Telecomunicaciones, UPM.



From Open Science to Open to the world

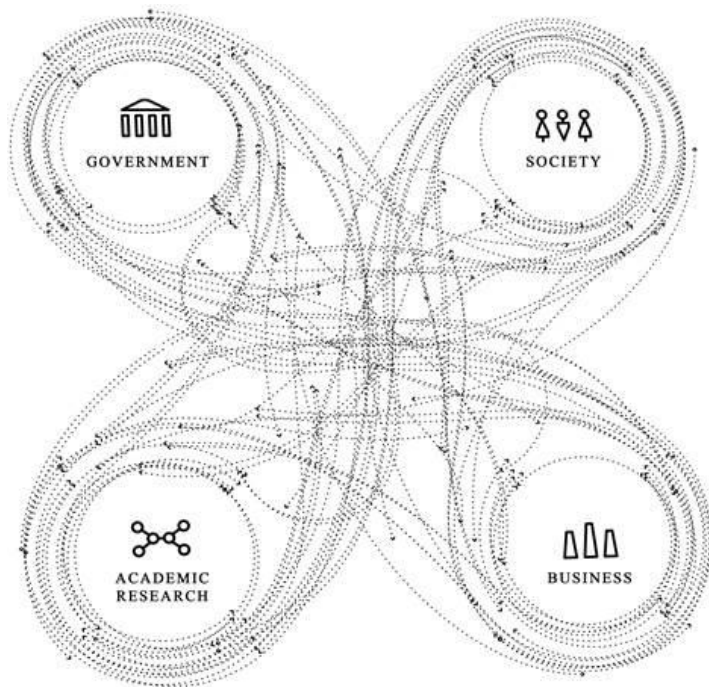
“Open Science is the idea that scientific knowledge of all kinds should be openly shared as early as is practical in the Discovery process”.

Michel Nielsen.

- **Scientific Knowledge of all kinds:** journal articles, data, code, online software tools, questions, ideas, speculations, failures, ...and anything which can be considered knowledge.
- **As is practical:** Very often there are other factors: legal, ethical, social...that must be



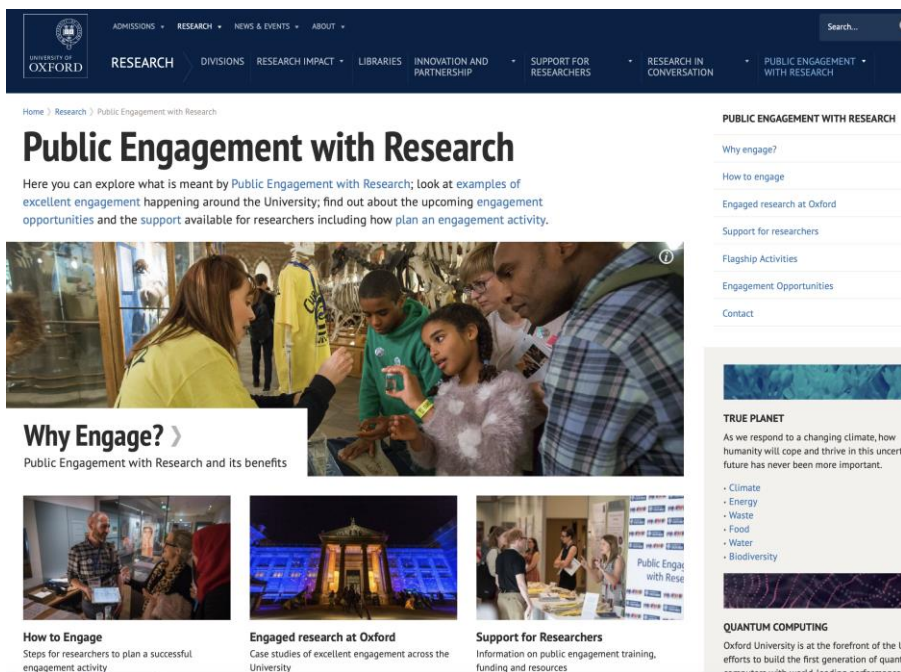
doi:10.2777/061652



QUADRUPLE HELIX OF INNOVATION MODEL

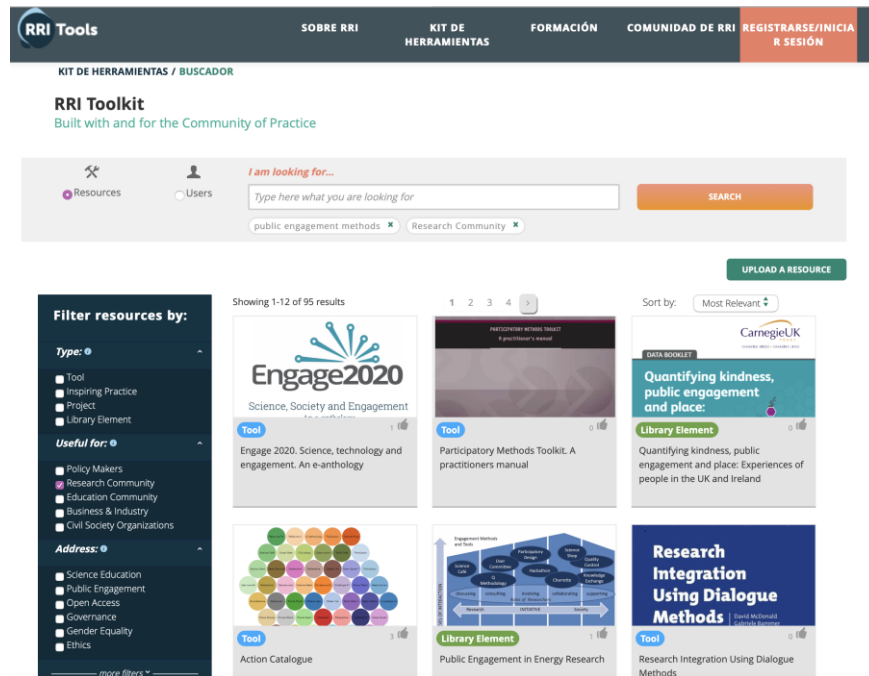
The **Quadruple Helix Model** of innovation recognizes four major actors in the **innovation** system: science, policy, industry, and society. In keeping with this **model**, we are prioritizing greater public involvement in **innovation** processes.

Engagement Practical Resources



The screenshot shows the website for 'Public Engagement with Research' at the University of Oxford. The header includes navigation links for Admissions, Research, News & Events, and About. The main content area features a large image of people engaged in a museum-like setting, with a 'Why Engage?' section below it. A sidebar on the right lists various engagement opportunities. At the bottom, there are three 'Practical Cases' highlighted: 'How to Engage', 'Engaged research at Oxford', and 'Support for Researchers'.

Practical Cases

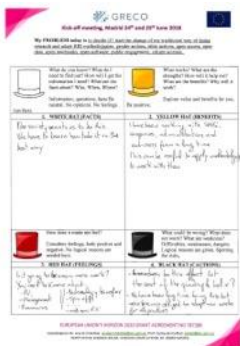


The screenshot displays the 'RRI Toolkit' website. The top navigation bar includes 'RRI Tools', 'SOBRE RRI', 'KIT DE HERRAMIENTAS', 'FORMACIÓN', 'COMUNIDAD DE RRI', and 'REGISTRARSE/INICIAR SESIÓN'. The main content area is titled 'RRI Toolkit' and 'Built with and for the Community of Practice'. It features a search bar with filters for 'Resources' and 'Users', and a grid of resource cards. The filter sidebar on the left allows users to filter by 'Type' (Tool, Inspiring Practice, Project, Library Element) and 'Useful for' (Policy Makers, Research Community, Education Community, Business & Industry, Civil Society Organizations). The 'Address' filter includes Science Education, Public Engagement, Open Access, Governance, Gender Equality, and Ethics. The resource grid shows items like 'Engage2020', 'Participatory Methods Toolkit', 'Quantifying kindness, public engagement and place', and 'Research Integration Using Dialogue Methods'.

RRI Tools

Engagement in GRECO

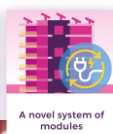
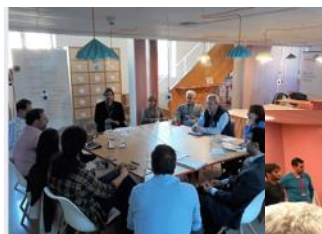
End-user Inputs



Open Innovation



Citizens Support



Dialogues



Hands-on



Hands-on



FREQUENTLY ASKED QUESTIONS



PROCESS



Blue Hat - Process

Thinking about thinking.
What thinking is needed?
Organizing the thinking.
Planning for action.

CREATIVITY



Green Hat - Creativity

Ideas, alternatives, possibilities.
Solutions to black hat problems.

FACTS



White Hat - Facts

Information and data.
Neutral and objective.
What do I know?
What do I need to find out?
How will I get the information I need?

BENEFITS



Yellow Hat - Benefits

Positives, plus points.
Why an idea is useful.
Logical reasons are given.

FEELINGS



Red Hat - Feelings

Intuition, hunches, gut instinct.
My feelings right now.
Feelings can change.
No reasons are given.

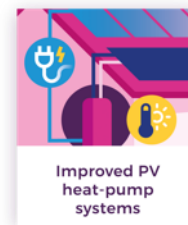
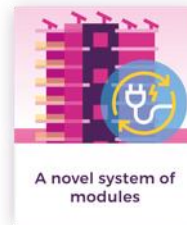
CAUTIONS



Black Hat - Cautions

Difficulties, weaknesses, dangers.
Spotting the risks.
Logical reasons are given.

Scientific Challenge: Medium-term and long-term novel PV products to enable a major integration of PV systems in cities



Drivers

✓ Need of PV solutions for urban areas, which are huge energy drains:



- Buildings are responsible for 36% of EU CO₂ emissions
- Buildings represent half of Europe's energy demand
- 75% of EU buildings were built before energy performance standards existed

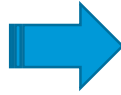
Data compiled in "SolarPower Europe & ETIP PV / SOLAR SKINS:AN OPPORTUNITY FOR GREENER CITIES"

Two-ways dialogues

Engagement



Mobilization and Mutual Learning Activities in six countries with all actors of the PV chain



Learning on the needs, concerns and expectations of PV

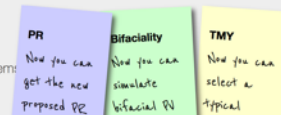
Exploitation & Dissemination Intensive Use of the OS Practices Rainbow!!!



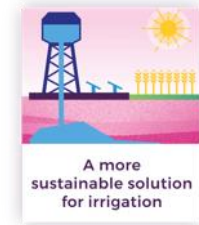
Video-Abstracts, Papers, Protocols, Proceedings, Talks, Posters, Datasets, etc...

SISIFO

SISIFO is a free web framework for simulating Photovoltaic Systems



Scientific Challenge: To obtain an ageing model for PV systems based on real installations data & develop a methodology for repairing PV modules in-situ.



Drivers

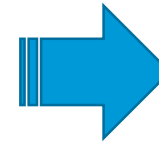
High costs of electricity for seasonal irrigation. PV energy is a proper solution.

- Large extensions of land requires high voltage pumps. Develop PV irrigation systems with more than 20PV modules (OPTION A)
- Scarcity of water resources, but necessity of responsible solutions. Integration of PV desalinization and PV irrigation systems (OPTION B)
- Energy storage. Development of a sizing procedure of Li-ion batteries for PV systems (OPTION C)

Co-design Innovations

Engagement

Open Innovation activities for gather insights and codesign the most urgent solution. 77 effective responses. Around 500 actors contacted.



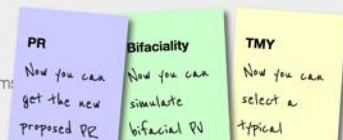
Showroom at the end of P2.



Exploitation & Dissemination

SISIFO

SISIFO is a free web framework for simulating Photovoltaic Systems



On the number of PV modules in series for large-power irrigation systems

L. Navarrete^{*}, R.H. Almeida^{1,3}, R. Carrillo¹, L. Rodriguez¹, L.M. Carrasco¹, F. Martínez-Morena¹

[Show more](#)

<https://doi.org/10.1016/j.enconman.2019.03.001>

Under a Creative Commons license



Gold Open Access

Self-Archive

Citizen science is the public involvement in inquiry and discovery of new scientific knowledge

- ✓ Finding data
- ✓ Collecting data
- ✓ Classifying data
- ✓ Analyzing data
- ✓ Curating data
- ✓ Home-made set-ups for measuring
- ✓ Etc...

Hands-on



Who is benefited?

Professional researchers
or/and Public Administrations
or/and citizens
or/and civil organizations

But It's IMPORTANT to ensure the engagement of the Citizen Scientists



Scientific Challenge: To obtain an ageing model for PV systems based on real installations data & develop a methodology for repairing PV modules in-situ.

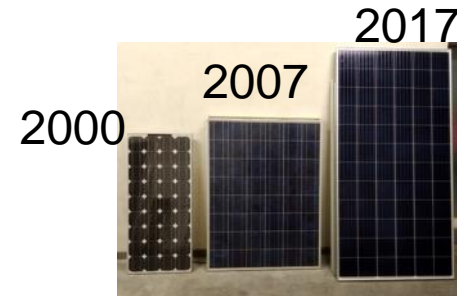


Drivers

- ✓ Real ageing Identification along PV systems lifespan.



- ✓ Spare Pieces Availability for 30 years?



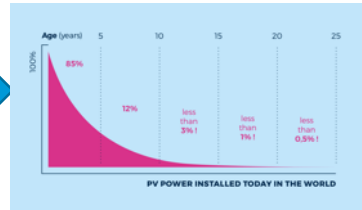
- ✓ Influence on the energy production and impact on Due Diligence

- ✓ Circular Economy Support

Engagement



Citizen Science



3 workshops with SME Installers

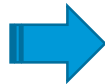


Looking for needles in a haystack!!

How to promote the engagement?



- Selected installations will receive an audit of their installation for free.
- If some defect appears and the repairing procedure can be applied, then the installation will be repaired for free.





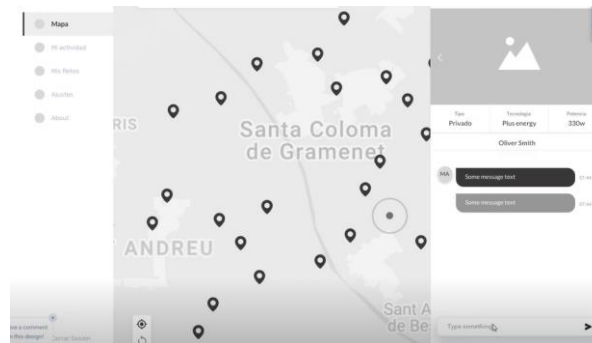
D-NOSES

Distributed Network for Odour Sensing,
Empowerment and Sustainability

STARS4ALL

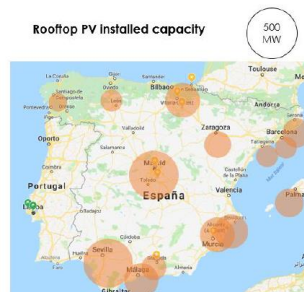


And soon....

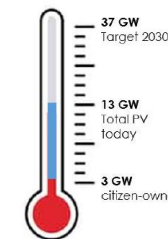


First-hand Experience

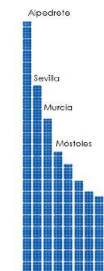
Awardness



Climate Objective



W / per capita



Scientific Community



Social (towards Keeping the engagement)



[Qué es la Oficina de Ciencia Ciudadana]

Se entiende por *ciencia ciudadana* a la investigación científica que cuenta con la implicación activa del público no especializado. Cualquier persona dispone de conocimiento, herramientas y recursos que pueden contribuir al avance de la ciencia. Para saber



When a Citizen Science Office in Madrid?

Thanks for your attention

www.greco-project.eu

