

Smart Grid Case Studies

Innovative Regulatory Approaches with Focus on Experimental Sandboxes 2.0

Casebook

Austria, Belgium, Canada, Denmark, France, Israel, Italy, Norway, Sweden and the United Kingdom

ISGAN Annex 2

October 2021



About ISGAN Casebooks

ISGAN casebooks are meant as compendium documents to the global trends and discussion about smart grids. Each is factful information by the author(s) regarding a topic of international interest. They reflect works in progress in the development of smart grids in the different regions of the world. Their aim is not to communicate a final outcome or to advise decision-makers, but rather to lay the ground work for further research and analysis.

Disclaimer

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Acknowledgments

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¹ The ISGAN Knowledge Transfer Project (KTP) constitutes a deep-dive approach for international collaboration on key topics of relevance for the development and deployment of smart grids. Placing focus on individual learning and collective co-creation by interdisciplinary groups of participants with complementary competencies, the KTP concept involves interactive workshops preceded by considerable participant preparation and results in material (e.g. policy messages for ministers or project reports) enabling continued efforts on the topics in focus and a wider dissemination to relevant stakeholders in ISGAN countries and beyond. For more information see: www.iea-isgan.org/knowledge-transfer-project/

Preface

Innovation is among the most important levers to successfully cope with the challenges of climate and energy policy. Therefore, it is important to complement conventional approaches of piloting technological solutions and to make sure that regulation facilitates innovation.

Innovative solutions like Smart Grids can entail higher risks that not all regulatory frameworks recognize. In several countries, regulators have put in place regulatory mechanisms to support innovation, both in demonstration and in deployment (roll-out) stages. Regulatory experiments can be a useful additional tool for testing innovative Smart Grid solutions under future regulatory framework conditions.

Thus, Regulatory Experimenting offers an effective measure to enable innovation and pathway discovery for all of the actors involved in realizing an inclusive and sustainable energy future.

Regulatory experiments such as regulatory sandboxes² would provide an arena for product, process and service innovations and business models, based on interventions in regulatory frameworks (e.g. energy laws, exemptions, derogations, tariffs, building regulations, zoning rules, etc.) and/or other framework conditions (e.g. creating an atmosphere of active participation), thus requiring legislators, public administration as well as other stakeholders to be involved.

Building on the first initiative on Experimental Sandboxes (2019), ISGAN has organized a followup project (2021) with a series of interactive knowledge transfer workshops and accompanying activities on maximizing policy-learning from Regulatory Experimenting programs or initiatives.

As this is a new kind of mixed policy intervention with complex governance issues between public, semi-public and private actors, efforts have to be made and resources provided to develop an adequate mix of innovation-oriented legislative or regulatory measures, as well as project-related support mechanisms and funding instruments.

In addition to the first edition of Regulatory Sandbox casebook, this second edition provides more detailed information on planned or implemented regulatory experimenting and sandbox programmes as well as examples of regulatory experimenting and sandbox projects in the power sector in countries including Austria, Belgium, Canada, Denmark, France, Israel, Italy, Norway, Sweden and the United Kingdom.

² In some countries, the basic ideas are taken from the FinTech sector's currently developed Regulatory Sandbox instrument.

Executive Summary

Building on the first initiative on Experimental Sandboxes (2019), ISGAN has organized a followup project (2021) with a series of interactive knowledge transfer workshops and accompanying activities on maximizing policy-learning from Regulatory Experimenting programs or initiatives.

Three international workshops and several interlinked workshops at national level have focused on questions regarding relevant actors, the orchestration of actors, the role of transformation strategies, effective policy learning processes and legal prerequisites for Regulatory Experimenting.

During the course of the project, it became clear that a broader view on experimenting helps to position national initiatives without losing focus on how to maximize learning from these.

Therefore, the concept of Regulatory Experimenting was adopted, which contains a wide range of tools for supporting innovation.

The following messages were formulated by the ISGAN Sandbox KTP Project Team and the transdisciplinary group of participants in the workshops, with the intention to bring it to the attention of the Clean Energy Ministerial. Four policy messages were successfully presented to a variety of stakeholders in the power sector around the world at the twelfth Clean Energy Ministerial (CEM12).

Message #1: There is no one-size-fits-all model for experimenting; policy makers, together with regulatory bodies, can deploy different types of experiments to suit their needs.

- There is no off-the-shelf model for experimenting, but rather a toolbox of different experiment types. This can be further refined, based on the best practice already available.
- At one end of the spectrum are sandbox programs and sandbox support services that help innovators to deliver their trials and bring to market new products, services, methodologies and business models. Sandbox programs may have different objectives e.g. emphasizing more innovation than regulatory aspects. Policy learning is important, but its role depends on the goal of the program. Policy learning tends to be less formal, with less accountability to the results of the experiments themselves.
- At the other end of the spectrum are regulatory experiments that are specifically designed to explore new solutions for evolving regulatory frameworks in a consistent manner with system transformation. Policy learning is a key driver of the experiment, with greater accountability to the results of the experiments.

Message #2: Regulatory experiments are about learning and are particularly strong if they are not stand-alone, but aligned with a broader transition strategy.

- Experimenting for accelerating the energy transition needs to be aligned to a transformational strategy and a long-term vision for meeting net-zero commitments if it is to be an effective contributor for change. A vision of a future energy system, a

strategic mission as well as a clear agenda (roadmap) and competences should build the basis for designing innovation programs that support regulatory experiments.

- In order to maximize learning from the experiment, experimental design is key.
- It should be taken into account which regulatory barriers market participants encounter. However, any regulatory option that is tested in an experiment should also be linked to a vision of the overall system. The regulatory experiment should be designed and evaluated to learn about the effectiveness and efficiency of regulatory options.
- Without such a clear vision, just introducing regulatory exemptions makes it difficult to learn from the experiment for future regulation.
- Considering policy learning as the main aim of regulatory experiments, alternative regulatory options should ideally be tested. With such an aim in mind, introducing exemptions only on request of innovators, who might not be interested in the benefits of testing alternative regulatory options for the future energy system, would reduce the potential learning effects.
- Therefore, alternative regulatory options should be tested, rather than just introducing exemptions on request of innovators only.
- Moreover, it is important to consider the impact of the experiment if scaled up to the national scale and in future scenarios.

Message #3: Regulatory experiments are all the more powerful, the more a broad range of actors get involved as well as orchestrated.

- Stakeholder involvement and orchestration needs to be explicitly organized.
- Policy makers with a clear mandate always play a key role. Clearly defined roles for national governments, sub-national governments and regulators are needed. The range of competences of national administrations varies significantly (e.g. market regulation competences in larger countries are in the responsibilities of states/provinces/territories).
- Different stakeholders should be involved in the experiments, and program owners and engaged regulatory authorities are encouraged to extend the dialogue to other stakeholders than regulated companies. It is recommended to also include stakeholders that are not considered as incumbent actors and stakeholders, e.g. energy communities, cities, and actors from other sectors such as the mobility sector.
- Experimenting is meaningful if associated with institutional learning across multiple actors. A wider range of interests and players associated with academic as well as research-rooted evaluation frameworks are key factors, if a fruitful learning is expected to stem from regulatory experiments.

Message #4: Regulatory experiments for Smart Grids need an effective legal basis.

- As compared to pilot projects focusing on technological solutions, regulatory experiments are more demanding in terms of legal preconditions.

- The emerging business cases and business models with Smart Grid technologies often challenge the existing regulatory constructs and associated legislation, which was designed with a very different role for customers, utilities and the private sector in mind. For the energy sector, programs for Regulatory Experimenting need to be designed in a way that maintains customer protection and a fair level playing field. Regulatory bodies, like those operating in the energy sector, are in most cases in charge of such purposes and therefore may design appropriate regulatory experiments, to avoid undesirable effects of innovation.
- On that basis, legislators should entitle regulatory bodies, where they aren't yet, to handle some flexibility for experimenting, in addition to their principal duty to set regulatory frameworks.
- A principle-based regulatory approach might allow for more experimenting and thus helping to accelerate an inclusive energy transition. Such an approach would also open new space to consider inclusion, affordability, fairness along with energy and climate objectives.
- Regulatory experiments can be initiated both by governments as well as regulatory bodies, yet regulatory bodies will be crucial for experiments in the energy sector in many countries.
- Regulatory bodies often cannot grant regulatory exemptions, given the lack of a legal basis. Thus, in some countries there is a need for providing the legal basis for regulatory bodies first.
- If regulatory bodies should play a role in accelerating the energy transition aligned to a transformational strategy and a long-term vision for meeting net-zero commitments, they need to be provided with a legal mandate. In most countries involved in the workshop series, regulatory bodies lack such explicit authorities or capabilities. Thus, there is a need for assessing whether changing the legal basis for regulatory bodies is required in order for regulatory processes to contribute more productively to the transition process for a net-zero energy future.
- Finally, where there may not be a legal barrier to regulatory experiments, there may be a practical barrier in that regulatory bodies are often resource constrained when considering the amount of effort required to stay on top of the amount and pace of change being observed with electricity sector modernization and transformation. Regulators may require legislative or policy authority to properly resource these activities.

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1. WHAT ARE THE REGULATORY EXPERIMENTS?

Broadly speaking, regulatory experiments can be defined as a means to deliberately deviate from the current regulatory framework to try out new or different rules in a real-world setting.

General characteristics are: the key role of public regulations, the involvement of government actors and/or regulatory bodies (national level or also local level in some countries), and the generation of learning processes.

There are regulatory experiments that provide a framework for socio-technical experiments, i.e. experiments with new technologies, business cases or social innovations. There are also regulatory experiments where regulation itself is the main object of experimentation and learning.

When speaking of “regulation” and “regulatory experiments”, we mean the whole range of public policy instruments, procedures and organizational structures. Regulatory experiments can be found in a range of sectors around the world³. Experiments rooted in the real world enable policy learning and innovation with an eye on social and economic benefits of Smart Grids for individuals, communities and for all stakeholders in society.

Given the relationship between legislation, policy making and regulation, Regulatory Experimenting requires strong leadership from policy makers in order for it to be effective and for the experiments to potentially result in any lasting change. When considering the role of regulation within clean energy transitions, the same principle holds true. Regulatory processes can bring clarity by interpreting policy; importantly they can inform policy, but they do not create policy. Thus, the capacity to orchestrate new and incumbent players, as well as interest groups and stakeholders will rely on policy-making processes to provide alignment for the various stakeholder efforts toward new directions or targets if required. That said, regulators can play an important complementary role in making the processes of informing policy more accessible or inclusive to various stakeholder groups. This description of the relationship between policy and regulation relevant to the energy transition was validated across countries during a recent ISGAN workshop series.

The relationship between policy-making and regulatory processes is not always so productive however, and it became clear in the discussion that regulatory bodies, which in some cases have already started to support innovation, still need to be empowered in many cases, by a more active role in innovation as well as policy learning and development. A vision emerged from the ISGAN workshop series wherein productive relationships between regulators and policy-makers, each leveraging the capabilities and tools offered by the other, can accelerate electricity sector modernization and transition, leverage greater societal value offered by Smart Grid capabilities, and enable the broader energy sector transformations, in particular with respect to decarbonizing heat and transportation. The following case studies describe the nature of regulatory experimentation/sandbox programmes and example of projects in the power sector, more specifically to the clean energy transition and Smart Grid adoption as reported by several countries.

³ 1 How to design and evaluate Regulatory Experiments? A guide for Public Administrations. March 2021, https://reragi.files.wordpress.com/2019/04/regulatory_experiments-guide_for_public_administrations.pdf.

2. CASE STUDIES BY COUNTRY

2.1 AUSTRIA

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Programme	Energie.Frei.Raum (Energy.Free.Room) Experimental areas / sandboxes for system implementation of new realization concepts and business models.	
Location (Country)	Austria	
Main scope of experiment	Smart grids, Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability, Integrated and flexible energy systems; system integration of RES	
Main innovation goal	New technological solution, product, service, New tariff-model and New business model	
Implementation Time Period	2019-2025	
Funding Amount (direct and in kind)	Public	5 Mio. EUR
	Private	n/a
Lead Organization	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)	
Additional Key Stakeholders/ Organizations	E-Control (Austrian Energy regulator) Austrian Research Promotion Agency FFG (programme implementation)	
Link to Programme Website/News	https://www.ffg.at/Energie.Frei.Raum	
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Background and Overview

■ Background

Energie.Frei.Raum is an R&I promotion program established within the framework of the Austrian Climate and Energy Strategy's (#mission2030) "Energy Research Initiative". It aims to give companies the possibility to test the systemic implementation of new technologies and market models for system integration of renewable energy sources, storage and energy

efficiency technologies. The legal basis for experimentation (exemption clause) is currently awaiting adoption as part of the Renewable Energy Expansion Act (Erneuerbaren-Ausbau-Gesetz "EAG"). The Strategy was drafted in connection with Austria's engagement in the global initiative Mission Innovation.

As part of the Austrian Energy Research Initiative, the funding program Energie.Frei.Raum (Energy.Free.Room) was launched in 2019 by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (from here on: Ministry for Climate Action).

Energie.Frei.Raum aims to support the goals of the national climate and energy strategy #mission2030 and the National Energy and Climate Plan (NECP) for the period 2021-2030.

It aims to reduce barriers for the implementation of market models stirring further system integration of RES, storage and energy efficiency technologies by overcoming barriers between testing and implementation. Funding for research and innovation projects will be provided with the funding instruments of the Austrian Research Promotion Agency (FFG) and the possibility to obtain regulatory exemptions as needed through E-Control (Austrian energy regulator) involvement in the proposal review and selection process. The Renewable Energy Expansion Act (Erneuerbaren-Ausbau-Gesetz "EAG"), which is to be adopted in 2021, will give E-Control the possibility to grant R&I and demonstration projects temporary exemptions and deviations from grid fees (electricity and gas).

The first call for proposals of Energie.Frei.Raum in 2019 was used to fund a contract research project (project title "F.R.E.SCH" - see project example in the next section) to: Engage all relevant stakeholders to 1) Identify topics and research questions for subsequent calls, 2) identify (regulatory) barriers to innovation, and 3) identify good practices and contribute to program design⁴.

■ **Program objectives**

Energie.Frei.Raum aims to contribute to reaching the Austrian Climate and Energy Strategy's goals. More generally, Austrian research and innovation is focused on the development of key technologies, sector coupling, digital and smart energy and marketable and comprehensive solutions and technology-based services. The Energie.Frei.Raum program's approach is meant to assist coordination between innovation efforts and development of the regulatory framework.

■ **The main objectives of the program are:**

- Contribute to the goals of the climate and energy strategy by facilitating the development and implementation of innovative technologies, processes, and business models for the integration of RES, storage, energy efficiency
- Provide R&I funding for the development of projects through to TRL 9;

⁴ The project „F.R.E.SCH” was concluded in 2020. Final report available here: https://www.bmk.gv.at/themen/klima_umwelt/energiewende/energiefreiraum/energiefreiraum_endbericht.html

- Enable both local innovators and the public to transform current problems into solutions and to help research and innovation unlock their potential by involving future technology customers and users in the testing and demonstration;
- Eliminate potential barriers to the testing and implementation of innovative approaches in the energy industry and energy and grid technologies by using temporary exemptions from the regulatory framework for specific innovation projects to allow innovators to test new technologies, processes and business models in a “real-world” setting. More specifically, it aims to:
 - Allow to create a framework for and a structured approach to regulatory innovation,
 - Collect first experience from different approaches in practice and not only in theory or through simulation
 - Enable both local and regional innovators and the public to transform current problems into solutions and to help research and innovation unlock their potential by involving future technology customers and users in the development process as test users
 - Better align innovative technological and grid / energy system solutions with innovative regulatory approaches and test the latter dynamically (as opposed to theory first, consequences later)
- Contribute to regulatory and policy learning processes for policymakers, regulatory authority, and innovators.

■ **Operational goals**

- Testing of new integration and market models for the integration of renewables, storage and energy efficiency technologies
- Survey of the needs and potential for regulatory sandboxes with the involvement of all relevant stakeholders,
- Support and implementation of concrete project ideas.
- Support regulatory and policy learning for the future development of the energy system.

■ **Innovation goals**

The overarching goal consists in developing and identifying best practices for smart, secure, affordable energy and transport systems. Further goals include:

- New technological solutions, products, services;
- New business models;
- New tariff models;
- Possibly upscale from demonstration to large-scale implementation.

Design of Policy Instruments and Implementation of Sandboxes

■ Program design

The contract research project funded within the 1st call suggested a 3-pillar approach to program implementation based upon the stakeholder engagement process as well as international good practices. The 3 pillars are:

- Pillar 1, Advisory and clarification processes: A consultation and clarification process should be set up, or expanded upon, to meet the needs of actors in the innovation process for information and advisory services on legal barriers for the development of solutions.
- Pillar 2, Create experimental space – enable experimentation: To enable experiments, some measures and steps are required in advance (ex-ante). Unlike pillar 1, which can also be carried out independently, the following steps are required in the implementation of real-world experiments: Legal preconditions (waivers, exemption processes ...) must be established. Selection procedures for the most promising experiments are to be carried out. Research and innovation infrastructure as the basis for the experiments must be guaranteed. Regulatory experimenting is to be carried out in the formats of innovation projects (pilot projects, proof of concept, ...) provided by the rules for RTI-funding. Accompanying monitoring of the experiments and an ex-post evaluation must be ensured.
- Pillar 3, Regulatory Learning / contribution to legal implementation: Findings from activities in the first two pillars can serve to further develop the energy system, since they provide the relevant actors and stakeholders (in regulation, legislation) with important learnings and reflection for the further development of the legal framework.

■ Project selection

The selection of RTI projects to be funded is planned as a two-step process involving both the Research Promotion Agency FFG and E-Control as the regulatory authority. Proposals shall be first screened and pre-selected by the FFG for overall eligibility and innovativeness through its established RTI-funding rules and selection processes. In a second step, projects selected for RTI-funding can apply for an exemption from grid fees (electricity and gas) for up to 3 years. The application to E-Control must contain: 1) the objectives of the project, 2) proof of successful RTI-funding application, and 3) type and scope of exemption request.

■ Key actors and roles

Thus, the key actors in the program are:

- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology: program owner – strategy, program design, funding
- Austrian Research Promotion Agency: program implementation
- E-Control: regulatory oversight

■ The legal basis for experiments

The legal basis for experimentation (exemption clause) is currently awaiting adoption as part of the Renewable Energy Expansion Act (Erneuerbaren-Ausbau-Gesetz "EAG"). The exemption clause enables the regulatory authority to grant exemption from grid fees for electricity and gas, i.e. reductions, exemption from grid fees, departure from fee structure. The regulatory authority E-Control may grant exemptions to projects meeting RTI-funding eligibility for up to three years. Exemptions can be granted only to research and demonstration projects contributing to at least two of the following strategic goals:

- System integration of renewable energy, storage, and energy efficiency technologies, including the use of new business models
- Increased use of renewable energies, including decentralized and regional use concepts
- Digitalization of the energy system
- Increasing the societal acceptance of the energy transition and necessary transformation processes
- Implementing storage, sector coupling and related technologies/processes
- Realizing market and/or flexibility potentials
- Increasing efficiency and security of supply, especially through flexibility services
- Accelerating or facilitating future network expansion

Programme implementation

■ Program implementation

2019 – 2025

The first call for proposals was opened in 2019 and funded a project to support program design through stakeholder engagement and needs analysis. The second call for proposals is expected in 2021.

■ Learnings and good practices

- The setting up of a regulatory sandbox in practice requires a multifold approach that considers the current status of innovation and regulation, funding opportunities and potential cooperation on the national and international levels.
- In a strict sense, Energie.Frei.Raum is a *techno-regulatory innovation zone* as technological change is "co-optimized" with regulatory change to identify successful solutions and business models but also approaches to stakeholders' responsibilities, rules and regulation. That said, both types of innovation are given equal priority.

The process of setting up of regulatory sandboxes is associated with a number of risks that should be accounted for as part of the risk management procedure:

- Risk to create a permissive environment or a regulatory vacuum if an exemption from the current regulation is granted but no feasible alternative is considered.
- Risk of not defining the scope or the temporal limitation of a sandbox from the start: a sandbox is always a preparation phase and not the final goal.
- The best approach could not be identified within the allotted timeframe (e.g. due to insufficient resources to accomplish the activities).
- Technology-neutrality principle: the regulatory approach may disproportionately benefit one stakeholder group or technology over another even if they are not economically viable. As a result, the identified models may not improve economic viability and business models or cannot be transferred to a broader context or to other stakeholder groups.
- The approach might still be localized i.e. not entirely suitable for replicability/fits the local context rather than the European or global one. Should be relevant from the whole system perspective, the whole country
- Roles and responsibilities of actors involved have not been sufficiently defined.
- The proposed instrument from a regulatory sandbox may conflict with another existing instrument or policy
- The next steps for the actual implementation of the outcome of a sandbox have not been formalized before the project start or the evaluation criteria/monitoring procedure were not stipulated.

EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	F.R.E.SCH - Freiraum für Regulatorisches Experimentieren Schaffen (Contract research project in support of stakeholder engagement, needs analysis, identification of regulatory barriers for Energie.Frei.Raum funded under its 1 st call in 2019)	
Location (Country/City)	Austria	
Main scope of experiment	This project was not an experiment/sandbox per se, rather its purpose was to inform the possible design of the regulatory sandbox program Energie.Frei.Raum. It included the research fields RTI-policy, energy law, public law and governance, energy economics, energy technologies	
Main innovation goal	Consolidate, specify, and prioritize subject areas and research questions relevant for the Energie.Frei.Raum program, identify regulatory challenges and assess the impacts if they were remedied. Identify and assess the need for regulatory sandboxes for R&I activities.	
Implementation Time Period	2019-2020	
Funding Amount (direct and in kind)	Public	€120,000
	Private	N/A
Lead Organization	AIT – Austrian Institute of Technology	
Partner Organizations	Energieinstitut an der JKU Linz Vienna University of Economics and Business - Research Institute for Urban Management and Governance	
Link to Project's Website/News	https://www.bmk.gv.at/themen/klima_umwelt/energiewende/energiefreiraum/energiefreiraum_endbericht.html	
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Overview of the Project

■ Background

The contract research project F.R.E.SCH (Freiraum für Regulatorisches Experimentieren Schaffen) was funded under the 1st call for proposals of the Energie.Frei.Raum program in 2019. It is not a regulatory sandbox project, rather it was intended to contribute evidence for

the future implementation of regulatory sandboxes within the Energie.Frei.Raum program. The project objectives are:

- Consolidation and specification of subject areas and research questions relevant to the Energy.Free.Room programme; identification of relevant regulatory challenges; assessing the impacts of remedied regulatory challenges/barriers (through consultation and clarification processes as well as regulatory experiments); prioritization of research topics.
- Compilation and assessment of the need for granting regulatory exemptions for the implementation of research and development activities, involving key actors and stakeholders.

The project was carried out between September 2019 – May 2020. The consortium was highly interdisciplinary, consisting of experts in the fields of research, technology and innovation (RTI) policy, energy law, public law and governance, energy economics, and energy technology. The participating organizations were:

- Lead: AIT - Austrian Institute of Technology
- Energieinstitut an der JKU Linz
- Vienna University of Economics and Business - Research Institute for Urban Management and Governance

The methodology consisted of desk research (legal and regulatory framework, regulatory barriers, international sandbox experiences), interviews, stakeholder analysis, and 2 participatory stakeholder workshops.

An objective justification can lie in the character of the policy instrument as a learning and experimenting space for climate and energy policy goals. A transparent selection process and accompanying monitoring and reporting obligations are also recommended from an innovation policy perspective and contribute to the objective justification.

■ **Key results**

The results of the project can be split into three categories: 1) Identified topics and research questions for regulatory experimenting, 2) conclusions and recommendations from the legal analysis, 3) conclusions and recommendations for the Energie.Frei.Raum program

(1) Topics for regulatory experimenting

Potential topics and research questions for the Energy.Free.Room programme were identified and prioritised through expert inputs, involving the most important stakeholder groups (innovation actors, need owners, policy makers and law experts) in the stakeholder workshops, and through analysis of research project reports. It has proven to be sensible and legally feasible to enable the creation of regulatory experiments, particularly in the following areas:

- Alternative proximity criteria for renewable energy communities
- Increasing the gas network limits for allowing more renewable gases

- Dynamic electricity network charges
- Direct feed-in of renewable gases into the gas grid
- Differentiation of supplier status (e.g. Energy Communities)
- Integration of profit-oriented service providers in energy communities
- Standardization / harmonization of power network communication and control infrastructure
- Exemptions from regulated network charges in case of network-supporting behaviour
- Exemption from network charges e.g. on batteries and power-to-heat
- Central platforms for power grid measurement data
- Mainstreaming accreditability of smart technologies as network costs
- Means of integrating local energy communities in the electricity system
- Alternative benchmarking parameters for assessing network operator efficiency
- Real-time status of the power grid (“traffic light system”)
- Participation in the balancing energy market for smart technologies and renewables

(2) Key messages and recommendations of the legal analysis

- Not all topics that were identified as “candidates” for regulatory experimenting in the course of the project from an energy policy or RTI policy perspective are suitable for it. In many cases, mandatory legal provisions stipulated by the EU legislator (in particular, the internal energy market rules of secondary legislation) even prevent it.
- There are, however, provisions where the EU legislator has given Member States the option of providing exemptions (i.e. Art 5 of the Regulation on the internal market for electricity where the EU legislator has explicitly given the Member States the option of providing exemptions from balance responsibility in the interest of innovative projects with limited time and content). The use of this authorization is recommended from an energy policy perspective.
- In general, the regulatory exemptions can be granted directly by law or in form of an ordinance on a legal basis. Since the design of regulatory experimenting (due to the variety of questions) can often not be precisely defined ex ante, it makes sense to create a legal basis that allows the authority to determine specifically tailored experimental space.
- From a constitutional perspective, the principle of legality and the objectivity requirement of the principle of equality are of great importance for the design of regulatory experimenting in energy law. The legislator must specify sufficiently who is responsible to grant exemptions by ordinance and / or decision and it must be specified what are to objectives and ground rules and procedures for granting exemptions for innovative projects.
- An objective justification can lie in the character of the policy instrument as a learning and experimenting space for climate and energy policy goals. A transparent selection process and accompanying monitoring and reporting obligations are also

recommended from an innovation policy perspective and contribute to the objective justification.

(3) **Key messages and recommendations for the Energie.Frei.Raum program**

- Regulatory experimenting could accelerate **the implementation of the climate and energy policy goals of the Austrian climate and energy strategy #mission2030, the national energy and climate plan (NECP) and the current government-programme**, thus contributing to their achievement.
- **Involvement of key players in the Energy.Free.Room program:** In addition to the legal framework and the question of governance at the implementation level, attention must be paid to the form in which key players in policy making (BMK, FFG) as well as the legislator and the regulator (BMK and E-Control) should be involved in the programme. This includes the selection, implementation, monitoring and ex-post assessment of projects. Furthermore, the design of the learning processes is paramount both for the legal actors and for the actors entrusted with programme governance.
- **Orientation toward the climate and energy policy strategy and orchestrated transformation paths for the future energy system:** Future-orientation and clear orientation of promoted measures toward climate and energy policy strategy goals can help innovators to (a) enact longer-term planning in the development of innovations and (b) coordinate research, development and innovation projects with other actors. By better orchestration of climate and energy goals the leverage effects of the instruments could be increased and help to make the future energy system more sustainable.
- **Establishing clear criteria for regulatory experimenting:** Among international actors there is a consensus that a clear delineation of experimental space is required through exemptions anchored in and regulated by law. This also results from the legal assessment made in the project. In particular, it must be determined for which periods and spatial scale exemptions should apply. In international comparison, the time frame for exemptions is between 3 and 10 years. The spatial coverage is guaranteed either explicitly or via the factual scope of approved projects. It is therefore also necessary to clarify the question of what happens after the project or once the exemption has ended (e.g. reuse or dismantling of test-infrastructure etc.)
- **The three pillars of an Energy.Free.Room program:** Within the framework of F.R.E.SCH, the international comparison and the discussions in the stakeholder workshops have resulted in a systematic understanding of the challenges different groups of actors (innovation actors, need owners, policy makers and legal-experts) face. In order to be able to meet the needs of these stakeholder groups, it is recommended to set up the Energy.Free.Rom programme based on a three-pillar model. This three-pillar model, if implemented within Energie.Frei.Raum would be the first regulatory sandbox programme internationally to systemically cover the breadth of possible activities from advice to learning and reflection
 - **Pillar 1 – Advisory and clarification processes:** A consultation and clarification process should be set up, or expanded upon, to meet the needs of

actors in the innovation process for information and advisory services on legal barriers for the development of solutions.

- **Pillar 2 – Create experimental space – enable experimentation:** To enable experiments, some measures and steps are required in advance (ex-ante). Unlike pillar 1, which can also be carried out independently, the following steps are required in the implementation of real-world experiments: Legal preconditions (waivers, exemption processes ...) must be established. Selection procedures for the most promising experiments are to be carried out. Research and innovation infrastructure as the basis for the experiments must be guaranteed. Regulatory experimenting is to be carried out in the formats of innovation projects (pilot projects, proof of concept, ...) provided by the rules for RTI-funding. Accompanying monitoring of the experiments and an ex-post evaluation must be ensured
- **Pillar 3 – Regulatory Learning / contribution to legal implementation:** Findings from activities in the first two pillars can serve to further develop the energy system, since they provide the relevant actors and stakeholders (in regulation, legislation) with important learnings and reflection for the further development of the legal framework.

References

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Energie.Frei.Raum und Regulatory Sandbox – Webinar presentation (July 2020)

https://www.ffg.at/sites/default/files/downloads/Webinar_Energie.Frei_.Raum_9.7_final_1.1.pdf

Kubeczko, K., Wang, A., Schmidt, R.-R., Friedl, W., Biegelbauer, P., Veseli, A., Moser, S., Madner, V., Wolfgruber, K. (2020). F.R.E.SCH. – Freiraum für Regulatorisches Experimentieren Schaffen, final report

https://www.bmk.gv.at/themen/klima_umwelt/energiewende/energiefreiraum/energiefreiraum_endbericht.html

Renewable Energy Expansion Act (Erneuerbaren-Ausbau-Gesetz EAG)

https://www.parlament.gv.at/PAKT/VHG/XXVII/ME/ME_00058/index.shtml

2.2 BELGIUM

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME_#1

Title of Program	DECISION (BRUGEL-DECISION-20190605-97) Relative à l'établissement d'un cadre dérogatoire aux règles de marché et tarifaires	
Location (Country/City)	Brussels (Belgium)	
Main scope of experiment	Smart electricity grid (only electricity related), Flexibility services for grid stability	
Main innovation goal	New technological solution, product, service, New tariff-model and New business model In addition, the framework aims particularly at the development of solutions to connect decentralized production to distribution networks	
Programme design	Experimentation space and Ex-post learning processes	
Regulatory body	BRUGEL (Bruxelles Gaz Electricité) - Brussels Energy Regulator	
Implementation Time Period	2019 – ongoing Derogations granted for 2 years – Since June 2019, BRUGEL, the Regulator of the Brussels-Capital region, has implemented a derogatory framework called “regulatory sandbox”. This framework makes it possible to test innovative technologies, new models or new businesses. In this context, developers carrying innovative projects can launch creative initiatives in favor of the development of the energy transition. A first exemption from market and pricing rules was granted in July 2020 for the first collective self-consumption project in Brussels, a Renewable energy community project around sharing electricity produced by a photovoltaic installation on a school as well as by an individual (link). A second exemption was granted in February 2021 as part of the innovative “Greenbizz.energy” project, a renewable energy community project around the sharing of electricity produced by photovoltaic installations placed on the roof of the Greenbizz incubator in Brussels (link). With this type of formula, consumers who do not have roofs can integrate a joint project to install photovoltaic panels. The aim is to be able to involve all Brussels consumers in the energy transition.	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	BRUGEL (Bruxelles Gaz Electricité) - Brussels Energy Regulator	
Additional Key Stakeholders/ Organizations	N/A	
Link to Program’s Website/News	https://www.brugel.brussels/publication/document/decisions/2019/fr/DECISION-97-CADRE-DEROGATOIRE.pdf	
Contact Information	Name	Marie Helene Novak
	Email	mariehelene.novak@sibelga.be

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME_#2

Title of Program	Regelluwe zone (Low-regulation zone)	
Location (Country/City)	Flanders (Belgium)	
Main scope of experiment	Smart electricity grid (only electricity related), Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability and Behind the meter	
Main innovation goal	New technological solution, product, service, New tariff-model, New business model, and New regulation	
Programme design	Advisory and clarification processes for innovators, Experimentation space, and Ex-post learning processes	
Regulatory body	Flemish Regulator of the Electricity and Gas Market VREG	
Implementation Time Period	2019 - ongoing 1 project granted (City of Genk and EnergyVille: Thor Science and Technology Park)	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	Flemish Energy Agency	
Additional Key Stakeholders/ Organizations	N/A	
Link to Program's Website/News	https://navigator.emis.vito.be/mijn-navigator?wold=77397	
Contact Information	Name	Frederik Loeckx
	Email	frederik.loeckx@flux50.com

2.3 CANADA

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Programme	OEB Innovation Sandbox	
Location (Country)	Ontario (Canada)	
Main scope of experiment	Scope of proposed projects is currently not limited to any particular type of innovation, and could involve any innovative ideas that have the potential to provide value to energy consumers	
Main innovation goal	New ideas, products, services and business models in the electricity and natural gas sectors that have the potential to provide value to energy consumers	
Implementation Time Period	2019 – present (ongoing)	
Funding Amount (direct and in kind)	Public	Funding is not available through the OEB Innovation Sandbox. Subject to approval through a separate process, certain kinds of utility projects can be funded through utility tariffs. Some proponents that have accessed the OEB Innovation Sandbox have been recipients of funding via other programmes, including the Independent Electricity System Operator’s Grid Innovation Fund and funds administered by the federal government, and have approached the OEB Innovation Sandbox to discuss regulatory dimensions of their projects.
	Private	N/A
Lead Organization	Ontario Energy Board (OEB), the regulator of Ontario’s electricity and natural gas sectors	
Additional Key Stakeholders/ Organizations	N/A	
Link to Programme Website/News	www.oeb.ca/innovation	
Contact Information	Name	Rachele Levin
	Email	rachele.levin@oeb.ca

Background and Overview

The OEB’s Innovation Sandbox recognizes that innovation in the energy sector can benefit from specific regulatory supports to facilitate deployment by, among other things, clarifying the OEB’s expectations, policies and overall regulatory framework in the context of a specific

project or proposal. The OEB Innovation Sandbox is the only regulatory sandbox in the energy sector in North America*.

The OEB Innovation Sandbox is designed to assist utilities and other companies interested in innovative energy-related projects that show clear potential for benefit to energy consumers – whether in the form of long-term economic efficiencies, cost performance improvement, service enhancements or other ways.

OEB Innovation Sandbox provides an opportunity for innovators to work with OEB staff to determine whether and to what extent particular regulatory requirements might stand in the way of a novel approach, and to find ways for innovators to move ahead with a project on a trial basis. Support is provided in the form of customized guidance and/or temporary relief from a regulatory requirement on a case-by-case basis.

* As of May 1, 2021

Design of Policy Instruments and Implementation of Sandboxes

(Development) The OEB Innovation Sandbox was developed by OEB staff based on best practices of energy sandboxes in Europe.

(Functionality) Innovators can use the OEB Innovation Sandbox to:

- engage in informal, candid dialogue with OEB staff at any time;
- access customized regulatory guidance;
- where appropriate and within the OEB's authority, pursue opportunities for temporary relief from a regulatory requirement. The OEB can exempt regulated entities from requirements under the OEB's own electricity Codes, natural gas Rules, licences or Orders. In more limited circumstances, the OEB is authorized to grant exemptions from certain legislative requirements.

Proposals can come from regulated utilities or unregulated businesses.

There are five eligibility criteria projects must meet to benefit from support offered by the OEB Innovation Sandbox:

1. Consumer benefit and protection - Projects must demonstrate a reasonable prospect of providing clear benefits to consumers. They must also have sufficient safeguards in place to provide consumers with a reasonable degree of protection during the trial.
2. Relevance - Projects must relate to natural gas or electricity services in Ontario.
3. Innovation - The project must involve testing a new product, service or business model not widely in use in Ontario.
4. Readiness - Proponents must demonstrate their readiness for carrying out the project. Plans and timelines must be well developed. The tools and resources required to enable testing the new product or service via the OEB Innovation Sandbox must be in place.
5. True regulatory barrier - For projects seeking relief from a regulatory requirement, proponents must articulate the regulatory requirement(s) at issue that would otherwise prevent the initiative from moving forward.

(Timelines) Proponents receive the benefit of certainty regarding project schedule through the sandbox process. OEB staff meets with proponents within 20 days of a request for a meeting. Following the initial meeting, the objective is to work within the proponent's timelines. In all cases, once all required information is received, the OEB Innovation Sandbox's commitment is to provide support within 185 days.

Programme Implementation

Since its inception in January 2019, the OEB Innovation Sandbox has supported over 50 engagements, including providing innovators with customized guidance for specific projects.

Lessons learned from the OEB Innovation Sandbox are shared through postings on the OEB's website. In one case, engagement with the OEB Innovation Sandbox also led to the publication of a document that captured the guidance provided by OEB staff through the OEB Innovation Sandbox, such that other regulated companies and interested stakeholders had the benefit of OEB staff's views on the regulatory treatment of behind-the-meter energy storage used for a specific purpose.

The document, known as a Staff Bulletin, is available **online**. Guidance provided by OEB staff through the OEB Innovation Sandbox is not binding on OEB Commissioners that decide rate and other applications that come before the OEB.

EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	AlectraDrive @Home	
Location (Country/City)	Ontario, Canada	
Main scope of experiment	Behind the meter, EV charging program	
Main innovation goal	Testing customer preferences and price incentives for off-peak EV charging	
Implementation Time Period	2021-2023	
Funding Amount (direct and in kind)	Public	Separately from the OEB Innovation Sandbox, through Ontario's Grid Innovation Fund and Natural Resources Canada's EV Infrastructure Demonstration Program.
	Private	N/A
Lead Organization	Alectra Utilities	
Additional Key Stakeholders/Organizations	<ul style="list-style-type: none"> - OEB Innovation Sandbox - Independent Electricity System Operator, Grid Innovation Fund - Natural Resources Canada, EV Infrastructure Demonstration Program 	
Link to Project's Website/News	https://www.alectra.com/sites/default/files/assets/pdf/Alectra_GREAT_Centre_AlectraDrive_Home_2020-01.pdf	
Contact Information	Email	alectradrive@alecrautilities.com

OUTCOMES AND HIGHLIGHTS OF SANDBOX PROJECT

Alectra Utilities is an electricity distributor that serves approximately one million homes and businesses across a largely suburban service territory in the province of Ontario.

Via an inquiry submitted to the OEB Innovation Sandbox, Alectra Utilities sought guidance regarding a proposed small-scale electric vehicle (EV) charging pilot known as AlectraDrive @Home. The project aims to assess the effectiveness of time-varying access fees as a means of incenting off-peak use of charging equipment. EV charging is a competitive service in Ontario.

At issue was whether the activities the utility intended to carry out as part of AlectraDrive @Home are permitted under relevant legislation (namely, the **Ontario Energy Board Act, 1998**, or OEB Act). Under the OEB Act, electricity distributors are not permitted to carry on any non-distribution activities unless an exemption applies or the OEB has determined that the activity should be allowed by reason of special circumstances.

Through the OEB Innovation Sandbox, OEB staff provided guidance to the effect that Alectra's participation in AlectraDrive @Home is permitted under the OEB Act, which allows electricity distributors to provide services related to load management that assist in achieving the Ontario government's goals in electricity conservation.

Support from the OEB Innovation Sandbox assisted Alectra in understanding how its activities in the AlectraDrive @Home project were consistent with the scope of activities permitted for distributors to undertake. As of the time of writing, the utility's customer recruitment for the pilot is expected to be initiated in summer 2021. Results from the pilot are expected in 2023.

IMPACTS ON REGULATORY CHANGE BY SANDBOX PROGRAMME AND ITS PROJECTS

By providing support for innovative projects, the OEB Innovation Sandbox reduces regulatory uncertainty and risk for utilities and other non-utility innovators for projects that have the potential to benefit energy consumers.

Innovators at work in the energy sector often require information and guidance on whether their project is possible under Ontario's regulatory framework. In allowing for informal discussions, the OEB Innovation Sandbox helps clarify what the regulatory framework allows and prohibits and whether there may be temporary exemptions that proponents could pursue to enable their project to proceed.

The OEB Innovation Sandbox provides support and guidance to innovators to test new business models and activities related to, among other things, storage, EVs and distributed energy resources. These activities provide insight into emerging challenges in the energy sector, as well as innovative solutions that can be deployed to tackle those challenges. This work is being used to inform the OEB's longer-term policy development initiatives to facilitate innovation that delivers value to energy consumers, in keeping with the OEB's legislated objective of facilitating innovation in the electricity sector.

2.4 DENMARK

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Program	Regulatory Test Zones It is intended to contribute to research that leads to: 100 % renewable energy in the national grid in market terms, and 70% reduction on national CO2-emissions.	
Location (Country/City)	Denmark	
Main scope of experiment	Smart electricity grid (only electricity related), Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability, and Behind the meter The framework also covers the topics of Digitalization, vehicle to grid, DC grids, energy islands	
Main innovation goal	New technological solution, product, service, New tariff-model, New business model, and New regulation	
Programme design	Advisory and clarification processes for innovators, Experimentation space, and Ex-post learning processes	
Regulatory body	The Danish Utility Regulator	
Implementation Time Period	2020 – ongoing	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	Danish Energy Agency (part of the Danish Ministry of Climate, Energy and Utilities)	
Additional Key Stakeholders/Organizations	N/A	
Link to Program's Website/News	https://ens.dk/ansvarsomraader/forskning-udvikling/regulatoriske-testzoner	
Contact Information	Name	Secretariat for Regulatory Test Zones
	Email	testzoner@ens.dk

2.5 FRANCE

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Programme	The regulatory sandbox In French “Bac à sable réglementaire” or “Dispositif d’expérimentation réglementaire”	
Location (Country)	France	
Main scope of experiment	Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability, More generally access and use of the electricity and gas grids	
Main innovation goal	New technological solution, product, service	
Implementation Time Period	November 2019.	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	The French energy regulator (in French, “Commission de regulation de l’énergie”) and the French Ministry for the Ecological Transition (in French, “Ministère de la transition écologique)	
Additional Key Stakeholders/Organizations	Some TSO and DSO are involved in the in-depth analysis, as well as Organizing Authorities for Energy Distribution when it is necessary.	
Link to Programme Website/News	Some information given by the regulator are available here: https://www.cre.fr/en/Energetic-transition-and-technologic-innovation/regulatory-sandbox	
Contact Information	Name	Guillaume BULLIER & Guillaume MAGNIEN
	Email	bacasable@cre.fr

BACKGROUND AND OVERVIEW

The transformation of the energy sector has accelerated. Indeed, the uses of networks are evolving in depth and at an unprecedented rate; with the development of renewable energies to meet global targets for reducing CO2 emissions, the rollout of new uses such as clean mobility or self-consumption, etc. These new uses generate new needs, particularly in terms of flexibility. At the same time, the digital revolution and new technologies such as storage offer new possibilities to meet these needs, via more intelligent and flexible electricity and gas networks. Finally, new innovative services and offers responding to specific consumer issues are emerging thanks to the digitization of networks and in particular, to smart meters.

In this context, the French Parliament has introduced a new competence for the French energy regulator (in French “Commission de Régulation de l’Energie”, hereafter “the regulator”) and the Ministry for the Ecological Transition (in French “Ministère de la Transition Ecologique”, hereafter “the ministry”): the regulatory sandbox in the energy sector.

The regulatory sandbox provides a legal framework adapted to projects allowing the testing of innovations that would ultimately require changes to the applicable regulatory and legislative framework. It should enable the regulatory framework to evolve in line with the needs of innovation in the energy sector.

More specifically, the regulatory sandbox allows the regulator and the ministry, under certain conditions, to grant temporary exemptions to project developers, allowing them to derogate from the conditions of access to and use of networks and facilities. During the first call for expression of interest, occurring in summer 2020, demands of exemptions concerned various topics such as electric storage, electric vehicles, smart metering, injection of synthetic gases, smart connection rules for renewable energy sources [1].

GOVERNANCE AND POLICY MAKING

In France, the regulator and the ministry are responsible for granting the temporary exemptions to project developers. However, there are not the only stakeholders involved. Indeed, the analysis of the exemption requests often requires the expertise of network operators. Subsequently, during the experimentation, some network operators must be involved in the project.

The implementation of the regulatory sandbox has led to several direct and indirect benefits. Among the direct benefits, we can mention the possibility for innovative project leaders to test services and products in real conditions and, at the same time, for the administration to test new regulations in a restricted area.

At the same time, the regulatory sandbox has also had indirect benefits. It has allowed reinforcing the links between the administration and innovative stakeholders. It has also made it possible to educate some stakeholders with few resources on some rules that do not constitute legal obstacles to their projects.

DESIGN OF POLICY INSTRUMENTS AND IMPLEMENTATION OF SMART GRID SANDBOXES

The perimeter is well defined. The regulatory sandbox allows the regulator and the ministry to grant temporary exemptions to the conditions of access to and use of networks and facilities resulting from defined legal provisions of the energy code. Legal provisions resulting from this perimeter can be secondary laws governing the network operator’s monopoly, market access rules owned by the TSO or network access rules owned by the DSO for instance.

All organizations can send an exemption request. During the first call for expression of interest (during summer 2020), demands of exemptions were expressed by energy utilities, car manufacturers, energy suppliers, start-ups, law firms, etc.

The regulator and ministry can grant temporary exemptions for a maximum of 4 years. The exemptions can be renewed once.

The ministry has not formalized the application and reviewing process. It has decided to process applications as they come in. Thus, project holders can submit applications throughout the year.

Conversely, the regulator has decided to formalize the application and reviewing process. The following only concerns the regulatory sandbox operated by the regulator. The regulator has decided to implement the regulatory sandbox in the form of an application window. Thus, the regulator processes all applications within the same timeframe.

The regulator has set 5 cumulative eligibility criteria. To be eligible, the project must (i) contribute to the objectives of the French energy policy defined in Article L. 100-1 of the Energy Code, (ii) present an innovative dimension, (iii) face a clearly identified legislative or regulatory obstacle, (iv) present a potential for further deployment, in particular if the experimentation achieves its objectives and (v) present a benefit for the community if the solution is ultimately deployed.

The regulator divided the procedure into 5 phases (cf. figures 1 and 2). Main elements are:

- **An application window (of approximately 3 months).** The regulator receives the exemption requests during the application window;
- **A preliminary eligibility analysis phase (of approximately 1 month and a half).**

According to the law, the regulator must notify the ministry of exemption requests the regulator has received. The ministry has a 2 months objection period.

The regulator runs the analyses of all exemption requests and decides on the eligibility of all applications with regard to the 5 above-mentioned criteria. If the request is not eligible, the regulator informs the project leader. If the request is eligible and the ministry is competent to grant the exemption, the regulator forwards the exemption to the ministry. If the request is eligible and the regulator is competent to grant the exemption, the regulator runs the in-depth analysis.

- **An in-depth analysis phase (of approximately 3 months).** During this phase, the regulator runs the in-depth analysis of the demands. The purpose of this process is to decide whether or not to grant the exemption and to specify its framework. The regulator can associate the networks operators to benefit from their expertise.
- **An experimentation phase.** During this phase, project holders run their experimentation and forward feedback on a regular basis.
- **The closing of the experimentation.** At the end of the experimentation, the regulator and the stakeholders run a global feedback. Depending on the conclusions, it might lead to evolutions of the legal framework

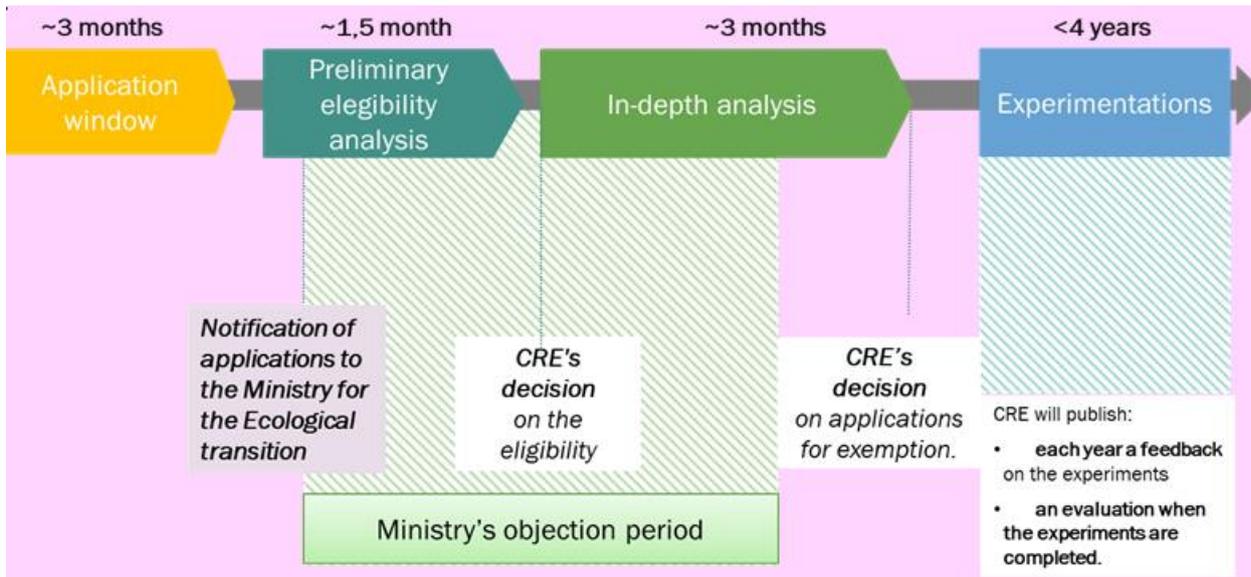


Figure 1: Process of the French regulatory sandbox implemented by the Energy regulator

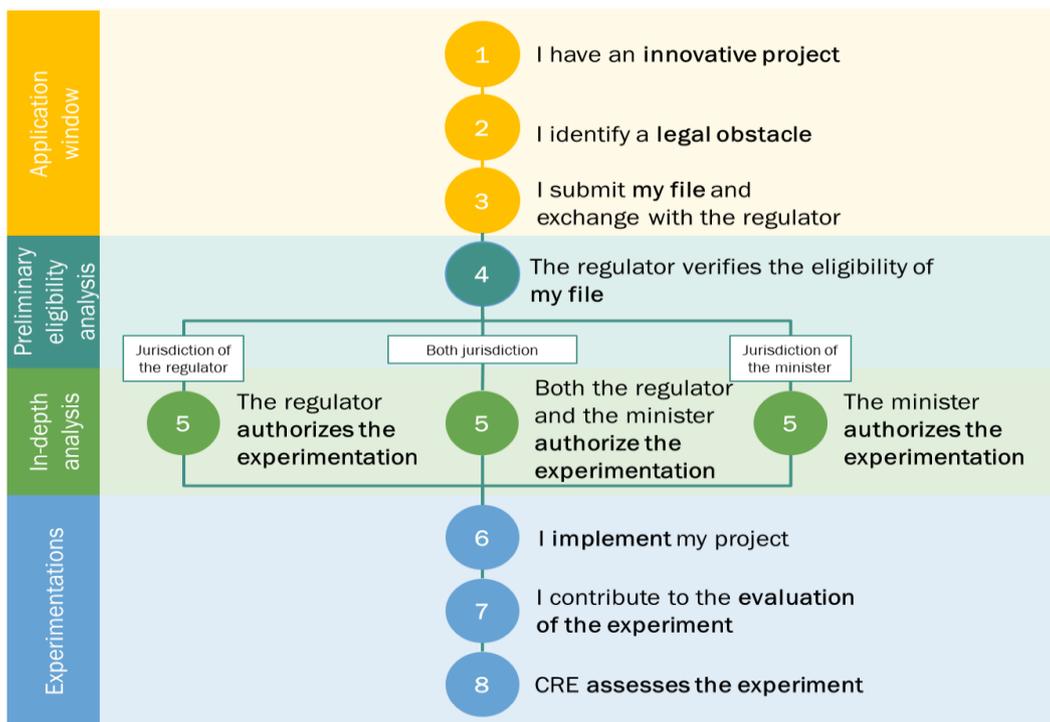


Figure 2: Process of the French regulatory sandbox implemented by the Energy regulator from the point of view of the project holder

PROGRAMME IMPLEMENTATION

The regulator opened the first application window for the regulatory sandbox from June 15 to September 15, 2020.

During this window, 42 applications for exemption were submitted to the regulator. The regulator published the conclusions of the eligibility analysis in a decision from November 5,

2020 [1]. In total, out of the 42 applications received, 20 projects were eligible for the regulatory sandbox, while 22 applications were ineligible.

The project leaders addressed various themes, such as electric vehicles, storage, flexibilities and power-to-gas. In particular, the first sandbox window allowed applications to emerge on four major issues for the future of the electric system: the participation of storage to energy markets, the integration of electric vehicles into the electrical system, the use of data from smart meters and the connection optimization of renewable energy facilities to the grid.

Of the 20 eligible projects, 2 fell under the jurisdiction of the regulator, 8 fell under the jurisdiction of both the regulator and the ministry, and 10 fell under the jurisdiction of the ministry.

The regulator issued the conclusions of the in-depth analysis of the files under its jurisdiction in the deliberation dated March 11, 2021 [2]. The regulator granted 2 exemptions to the 2 projects falling under its jurisdiction and 7 exemptions (over 8 requests) to the projects falling under jurisdiction of both the ministry and the regulator, making the experiments possible (additional exemptions may be granted by the ministry to extend certain financial mechanisms).

These experiments will test (i) new markets rules for storage, (ii) an innovative network tariff to develop local flexibility and (iii) a legal framework for the injection of synthetic gases in the networks.

The regulator issued the feedback of the first application window and decided to open a new application window from September 15 to December 31, 2021 in the deliberation dated July 23, 2021 [3].

References

[1] Délibération de la CRE du 5 novembre 2020 portant décision sur l'éligibilité des dossiers soumis à la CRE dans le cadre du premier guichet du dispositif d'expérimentation réglementaire prévu par la loi relative à l'énergie et au climat, available on the internet in French only : <https://www.cre.fr/Documents/Deliberations/Decision/eligibilite-des-dossiers-soumis-a-la-cre-dans-le-cadre-du-premier-guichet-du-dispositif-d-experimentation-reglementaire-prevu-par-la-loi-relative-a>.

[2] Délibération de la CRE du 11 mars 2021 portant décision sur l'octroi des dérogations des dossiers soumis à la CRE dans le cadre du premier guichet du dispositif d'expérimentation réglementaire prévu par la loi relative à l'énergie et au climat, available on the internet in French only : <https://www.cre.fr/Documents/Deliberations/Decision/derogations-premier-guichet-du-dispositif-d-experimentation-reglementaire>

[3] Délibération de la CRE du 22 juillet 2021 portant communication sur le retour d'expérience du premier guichet du dispositif d'expérimentation réglementaire prévu par la loi relative à l'énergie et au climat et ouverture du second guichet, available on the internet in French only : <https://www.cre.fr/Documents/Deliberations/Communication/retour-d-experience-du-premier-guichet-du-dispositif-d-experimentation-reglementaire-prevu-par-la-loi-relative-a-l-energie-et-au-climat-et-ouvertur>

EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	Méthycentre	
Location (Country/City)	Céré-la-Ronde, France	
Main scope of experiment	Integrated approach/sector coupling, Injection of synthetic gases	
(Main innovation goal)	New technological solution, product, service, Network connection rules	
Implementation Time Period	2021 - 2025	
Funding Amount (direct and in kind)	Public	N/A
	Private	Confidential
Lead Organization	Storengy SAS	
Additional Key Stakeholders/Organizations	ArevaH2Gen, Khimod, Prodeval, CEA, SIEI, GRDF, The French energy regulator (in French, " <i>Commission de regulation de l'énergie</i> ") and the Ministry for the Ecological Transition (in French, " <i>Ministère de la Transition Ecologique</i> ") are associated as well	
Link to Project's Website/News	https://methycentre.eu/	
Contact Information	https://methycentre.eu/contact/	

OVERVIEW OF THE PROJECT

The Méthycentre project carried out by Storengy SAS (hereafter "Storengy") consists in producing synthetic methane by methanation from hydrogen (produced by electrolysis) and CO₂ from a methanizer. The synthetic methane produced would be injected into the public distribution network operated by the DSO GRDF.

Storengy would like to benefit from the regulatory experimentation system in order to be able to inject the syngas produced into the public networks.

Indeed, the legal, contractual and technical framework currently applicable to the injection of gas into public networks was designed to support the development of the biomethane sector without explicitly considering, until now, other gases such as syngas.

Thus, most of the schemes preceding and conditioning the injection of gas into public networks do not include in the scope of their beneficiaries the injection projects of synthetic gas. The legal barriers concerned connection and injection contracts, registration on the

capacity register (which specifies the installation enables to inject into the networks), concession contracts, the possibility of injecting biomethane and synthetic methane via the same injection station, etc.

HIGHLIGHTS AND OUTCOMES

The Méthycentre project will help identifying a legal framework adapted to the injection of synthetic gas in the networks. Furthermore, it should lead to the development of standardized studies of the impact of hydrogen injection in the networks.

KEY LESSONS LEARNED

First feedbacks are expected by the end of the year 2021.

During the first application window, other stakeholders proposed similar experiments. In its deliberation dated March 11, 2021, the regulator grant similar derogations to 6 other stakeholders.

2.6 ISRAEL

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Program	Regulatory waivers for pilots in the energy market	
Location (Country/City)	Israel	
Main scope of experiment	<p>The scope of the regulatory waiver is an initiative for pilot projects related to the energy market. Examples for such projects are: Smart electricity grid, Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability, and Behind the meter storage.</p> <p>The first project under this waiver is flexibility services for grid stability</p>	
Main innovation goal	New technological solution, product, service and mostly path for new and updated regulation	
Programme design	Experimentation space and Ex-post learning processes	
Regulatory body	Israel Public Utility Authority for Electricity (PUA)	
Implementation Time Period	2020 - ongoing	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	Ministry of Energy of Israel	
Additional Key Stakeholders/ Organizations	Programme conception and design by the Public Utility Authority & Chief Scientist (Ministry of Energy). Israel Public Utility Authority for Electricity established the new measurement unit allowing regulatory waiver for experiments in the electricity market.	
	The regulator is also a key actor in ex-post learning from experiments	
Link to Program's Website/News	https://www.gov.il/he/departments/publications/Call_for_bids/shim_nis uiim	
Contact Information	Name	Yael Harman (CSO, Ministry of Energy)
	Email	yaelh@energy.gov.il

The programme is based on an explicit law (PUA's measurement unit 7d) that requires the approval of the Chief Scientist in the Ministry of Energy and the approval of the relevant utility to grant waivers on a case-by-case basis. Approval granted is based on a clear experimental programme. The goal is to speed-up adoption of new technologies and advanced regulation for the energy market.

No projects/waivers have been granted yet, the foreseen duration of projects is 3 years

2.7 ITALY

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Programme	Pilot Regulation The tool that the Italian Regulatory Authority for Energy, Networks and Environment (ARERA) has devised and developed to support innovation on a large scale in the power system	
Location (Country)	Italy	
Main scope of experiment	Smart electricity grid, Flexibility services for grid stability, Collective self-consumption in Italy, and Smart charging of EVs at home	
Main innovation goal	New tariff-model, New business model, New regulation, Extension of the Ancillary Services Market, Collective self-consumption using public distribution grid, and Facilitating EV smart charging at home (exploiting smart meter functionalities)	
Implementation Time Period	2018 > ongoing (launch in 2017 with Decision 300/2017)	
Funding Amount (direct and in kind)	Public	All pilot regulations are funded within ordinary tariffs
	Private	Market players who engage in pilot regulations bear their own costs
Lead Organization	ARERA – Italian Regulatory Authority for Energy, Networks and Environment	
Additional Key Stakeholders/Organizations	RSE – Ricerca sul Sistema Energetico (General-interest research institute in the energy sector)	
	GSE – Gestore dei Servizi Energetici (State Agency for renewables incentives)	
Link to Programme Website/News	www.arera.it	
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BACKGROUND AND OVERVIEW

Among European Union (EU) Member States, Italy is one of the most impacted by the transformation of the power system towards the targets of decarbonization set at EU-level. For many years the Italian Regulatory Authority (ARERA) has been committed to supporting the efforts of all interested parties, both on the grid-side and on the market-side, to introduce innovation that can accompany and facilitate this transformation.

In the 2019 ISGAN Casebook on “Innovative regulatory approaches with focus on experimental sandboxes”, many pilot projects launched by the Italian Regulator starting from 2010 were described, together with their outcomes and impacts. Most of these pilot projects were trialled on a relatively small scale, although in most cases the Regulator was engaged in extracting lessons learned and upscaling the results for a wider roll-out (like, for instance, in pilot projects for new smart functionalities of distribution grids, see Initiative #1 in Chapter 2.4 of the 2019 ISGAN Casebook).

Recently the Regulator has introduced new regulatory schemes that cope with large-scale dimension for innovation, i.e. without any confinement to approved areas (instead, this is typically the case of pilot projects and regulatory sandboxes, which are tools for small-scale innovation).

One of these large-scale experimental schemes was launched in 2017 and in 2019 its implementation had been just started, so that the ISGAN Casebook - edition 2019 only contains a first description: it is about “Flexibility services and Demand response” (see “Initiative #5” in Chapter 2.4).

This second contribution to the ISGAN Casebook (edition 2021) is meant to update the results achieved on this “Pilot regulation #1” on “Flexibility services and Demand Response” and to provide new information on two further Pilot regulations that ARERA has recently devised to support innovation at large scale in the power system, i.e.,:

- Pilot regulation #2 for “Collective self-consumption (CSC) in Italy”
- Pilot regulation #3 for “Smart charging of EVs at home (“private charging”)”.

GOVERNANCE AND POLICY MAKING

The Italian Regulatory Authority is empowered by law and so far almost all initiatives for fostering innovation have been rooted in its regulatory mandate, which is fully compliant with EU *acquis* (see in particular Directive UE 944/2019, articles 56 to 59).

The decision-making process of the Regulatory Authority is fully transparent, because all regulatory decisions are taken after a wide public consultation of interested stakeholders; motivation of final decisions is mandatory, taking into account also the written contributions collected and openly published. Although all final decisions of the Regulatory Authority can be appealed (in the Administrative Court), none of the decisions on regulatory tools for innovation have so far been concretely appealed.

In one case among those described in this contribution, a change in the legislation has been necessary (on collective self-consumption, which was prevented by the previous law).

DESIGN OF POLICY INSTRUMENTS

As already stated in the ISGAN Casebook edition 2019, the most recent initiatives at system level (i.e., designed for application on a large-scale) were meant as “*preparing the ground for subsequent regulatory schemes and decisions as well as for opportunities for new market*”

parties". ARERA considers a "pilot regulation" as *an ex-ante regulatory framework defining a transitional regime to cope with a novel issue* impacting the power system.

Essentially, a pilot regulation is a new, albeit transitional piece of regulation. The main feature is that a pilot regulation is explicitly intended as an experimental tool, whose results are to be examined in parallel to its implementation, in order to provide data, materials and concrete experience useful for evaluating how to establish a new definitive regulation on a given matter.

PROGRAMME IMPLEMENTATION

The programme was launched in 2017 with the first project on "Flexibility services and Demand Response" ("Pilot regulation #1"). The experimentation actually started in 2018 and is still ongoing.

The two subsequent projects started in 2020 ("Pilot regulation #2") and in 2021 ("Pilot regulation #3") and are expected to end in 2022 and 2023, respectively.

ARERA plans to further use the tool of Pilot regulation in case of emerging critical issues in the power system, in order to test and establish the suitable new regulation.

EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	Pilot regulation #1: Flexibility services and Demand Response Opening of the Ancillary Services Market to the participation of both RES and demand units, thanks to aggregation through virtual dispatchable units	
Location (Country/City)	Italy	
Main scope of experiment	Flexibility services for grid stability	
Main innovation goal	New business model, New regulation, and Extension of the Ancillary Services Market	
Implementation Time Period	2018 > ongoing	
Funding Amount (direct and in kind)	Public	Virtual Dispatchable Units have been allowed for a specific capacity remuneration, in addition to remunerating the effectively delivered resource; these costs are under evaluation and are covered through the final dispatching tariff (uplift).
	Private	Cost for control devices are borne by private participants in the pilot regulation
Lead Organization	ARERA	
Additional Key Stakeholders/ Organizations	TERNA (the Italian TSO) Balancing Services Parties BSPs Balancing Responsible Parties BRPs RSE – Ricerca sul Sistema Energetico (General-interest research institute in the energy sector)	

OVERVIEW OF THE PROJECT

■ Background and overall objectives

An extensive overview of background, scope and objectives of this Pilot regulation is reported in the ISGAN Casebook 2019. Essentially, this initiative aims at introducing aggregation of dispersed resources, including renewables and active demand, for enhancing flexibility services within the Ancillary Service Market (ASM). The new approach of Pilot regulation, i.e., at system innovation level, on a large scale, proved to be necessary for involving market parties, in a fully non-discriminatory manner.

■ Highlights and outcomes

Based on an ARERA Decision in 2017, the Italian TSO Terna launched different calls, each aimed at testing the performance of new aggregation of resources within the dispatching market.

The selected projects started in 2018 after approval of regulatory exemptions and obligations for each call. Regulatory exemptions have resulted to be crucial, since the current regulatory framework limits the participation in the Ancillary Service Market to the so called “Relevant Units” and only above a rather high capacity threshold: both of these constraints have been released for the experiments of aggregation of small-size resources previously not admitted to ASM, such as renewables and Demand Response. Different “Virtual Dispatchable Units” (including storage units) were admitted and tested during the trials. Details are also provided in the ISGAN Casebook 2019.

The projects participating in this Pilot regulation experiments have been running for about three years and are still ongoing. The results are being continuously monitored and evaluated by the Authority. As for the first two years, the Authority recently published the results: although the cost of distributed resources for providing ancillary services compatible with RES and DR (tertiary reserve, upward) proves to be still quite high, their firmness is rather good [1].

■ Key lessons learned and next steps

The evolution of the ARERA approach from “small-scale” pilot projects to “large-scale” *Pilot regulations* has been underlined in recent literature on regulation and innovation: with reference to this Pilot regulation initiative, researchers of the Copenhagen Business School state that “*the key concept of the experiment is that aggregators of small production and consumption units, so-called virtual dispatchable units, are derogated from certain regulations to allow them to provide balancing power. Previously, these ‘non-traditional resources’ were excluded from participating in the balancing market. To identify the most promising solutions for the future, Terna, the Italian TSO, tests different solutions in terms of settling activated resources, fees in the case of non-delivery, and settling imbalances*” [2].

Hence, Pilot regulations are a tool among others in the “regulatory toolbox” of ARERA: the experiment on Flexibility services and Demand Response has been intended to test in field the real firmness of distributed resources in providing flexibility services.

As a syntetical evaluation, the Authority stated that experiments trialled with this Pilot regulation “*have certainly proved useful, regardless of the low incidence of accepted offers compared to those presented, as they made it possible to test the methods and performance of providing ancillary services in an aggregate manner, as well as the operations of Balancing Service Providers (aggregators) and the methods relating to their dialogue with Terna and the individual final customers and producers belonging to the aggregate. Although the pilot regulation is not yet completed, the results obtained so far allow us to have the first elements useful to define the ways in which the same projects can flow into the regime regulation*” [3].

As for future innovative developments concerning the Ancillary Services Market, in August 2021 ARERA Decision 352/2021/R/eel was approved, which extends the flexibility services also to local ancillary services on the distribution networks, while until now the tested Virtual Dispatchable Units were used only - and will continue to serve - for "global" balancing services and not for local ones. Implementation of flexibility services at distribution level will develop in the next years through pilots to be proposed by DSOs (preferably jointly) after public consultation, including checks with the TSO where appropriate, and eventually approved by the Regulator. Decision 352/2021 defines criteria and responsibilities.

References

[1] ARERA, Report on RES impact on the system, n. 321/2020/l/efr (*Stato di utilizzo e di integrazione degli impianti di produzione alimentati dalle fonti rinnovabili e di generazione distribuita, Anno 2019*, available on the internet in Italian only:

www.arera.it/allegati/docs/20/321-20.pdf)

[2] Schittekatte, T., Meeus, L., Janssens, T., & Llorca, M. (2020). Regulatory Experimentation in Energy: Three Pioneer Countries and Lessons for the Green Transition. Department of Economics. Copenhagen Business School No. 19-2020CSEI Working Paper No. 16-2020, available on the internet at: www.cbs.dk/files/cbs.dk/regulatory_experimentation-schittekatte-wp16-final-v003-al-2020_11_30.pdf.

[3] ARERA, Consultation paper on new regulation for dispatching, n. 322/2019/R/eel (*Testo integrato del dispacciamento elettrico – TIDE. Orientamento complessivo*; available on the internet in Italian only: www.arera.it/allegati/docs/19/322-19.pdf)

EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	Pilot regulation #2: Collective Self-Consumption (CSC) in Italy First implementation of a regulatory model for the valuation of self-consumed electricity in collective schemes (jointly-acting self-consumers and energy communities)	
Location (Country/City)	Italy	
Main scope of experiment	Collective self-consumption in Italy	
Main innovation goal	New tariff-model, New business model, New regulation, and Collective self-consumption using public distribution grid	
Implementation Time Period	2020 > ongoing	
Funding Amount (direct and in kind)	Public	This pilot regulation is funded within ordinary tariff system as for network charges.
	Private	Private investments for new RES generation units are subsidised with a State incentive. The charge of State incentives on final users is collected through a levy that is completely separate from network tariffs (“system charges”).
Lead Organization	ARERA	
Additional Key Stakeholders/Organizations	RSE – Ricerca sul Sistema Energetico (General-interest research institute in the energy sector) GSE – Gestore dei Servizi Energetici (State Agency for incentives for renewables)	

OVERVIEW OF THE PROJECT

Self-consumption is the consumption of electricity produced at the same time on the same site or nearby. With the growing importance of this scheme, and, above all, of self-consumption of renewable energy, it is necessary to establish a regulatory framework that allows the development of self-consumption not only for “prosumers” (“one-to-one” configurations, i.e. a single generation unit combined with a single consumption unit), but also for enlarged configurations, namely “collective self-consumption”. This is characterized by multiple consumption units combined with one or more generation units (“one-to-many” configurations: for example, citizens living in apartments, sharing a PV unit on the rooftop of the same building).

Among the many innovations provided in the EU Clean Energy for all Europeans Package (CEP), important novelties include the introduction of the concept of “jointly-acting self-consumers” and of “energy communities”, in order to involve citizens in the transformation of the energy sector. Since self-consumption does not depend on sources, technologies, types

of electricity grids and corporate structures, it is perfectly compatible also with the case of jointly-acting self-consumers, i.e. a group of self-consumers located in the same building or multi-apartment block. Energy communities have a wider goal than sheer self-consumption, for instance promoting social cooperation among participants or fighting against fuel poverty.

In Italy, several “one-to-one configurations” have already been admitted for self-consumption, i.e., one customer and one producer who manages the power plant (the customer and the producer, in some cases, can also be two different parties). In existing configurations of this type, self-consumption has already reached about 28 TWh, of which only less than 21% is attributable to renewables.

The possibility to be jointly-acting renewable self-consumers and to establish Renewable Energy Communities (RECs) collective schemes was introduced into Italian legislation for the first time with article 42-bis of decree-law 162/2019 [1] (confirmed by law 8/2020 [2]), which explicitly anticipates, on the matter of collective self-consumption, the full transposition of Directive EU 2018/2001 (RED II). According to this decree-law, both jointly-acting renewable self-consumers and RECs have the goal of sharing electricity as it is self-consumed. The Italian Regulatory Authority is mandated by this piece of law to define all regulatory aspects.

Hence, after wide public consultation (Consultation paper 112/2020 [3]), with Resolution 318/2020 [4] the Authority launched the Pilot regulation related to shared electricity for self-consumption. Main innovation goal of this initiative is to introduce new regulation, at the same time testing new tariff models and new business models.

■ **Overall objectives**

The aim of the Pilot regulation on Collective Self-Consumption is to establish a transitional regime that is explicitly oriented toward learning from field experience in view of full transposition of CEP Directives (not only RED II, but also Directive 2019/944, and in particular art. 16 on “Citizen Energy Communities”). The transitional regime of this Pilot regulation does not anticipate all the configurations of collective self-consumption foreseen by European laws, but rather only those related to renewables.

In particular, jointly acting renewable self-consumers and RECs are enabled to produce electricity by means of Renewable Energy Sources (RES) power plants with capacity not above 200 kW (in operation after the date of entry into force of the law converting decree-law 162/19, i.e. from 1st March 2020, and within 60 days following the date of entry into force of the law transposing Directive 2018/2001).

Moreover, under the Italian transitional regime jointly acting renewable self-consumers must be located within the same building or multi-apartment block. By contrast, for RECs, customers and producers must be connected to public networks under the same MV/LV transformer substation: the limited perimeter derives from the fact that, in the transitional regime, RECs have the goal of sharing electricity as it is self-consumed.

■ Types of key actors/organizations

This Pilot regulation defined by the Authority is based on a regulatory model that is called a “virtual model”, because it allows the enhancement of collective self-consumption without the need for any new infrastructural interventions such as new direct lines or new meters.

Participants stay connected to their point of delivery and the electrical energy is shared using the public distribution grid. The regulatory model allows users who are part of the new configurations to maintain their rights (including especially the right of choosing their own retail supplier), to enter and exit these new configurations, to use self-consumed electricity according to the benefits derived, without any need to perform interventions or install new meters.

The “virtual model” also makes it possible to keep separate the economic benefits associated with self-consumption (which do not depend on sources, types of grids and/or company structures) and explicit incentives (which can be appropriately calibrated according to sources and/or technologies), avoiding hidden, implicit, incentives.

The model also allows the management of the support scheme (i.e. a policy decision to achieve the EU target and the energy transition) separately from the economic value of self-consumption (which, instead, is related to the actual benefit of self-consumption regardless of the source) from the perspective of the electricity system.

Participants regulate the relationships by means of a private law contract which identifies a delegated subject (the so-called “contact person”), who is responsible for the allocation of the shared electricity. Participants may also delegate to retail companies the management of payment and collection of RES-related incentives from the public agency for renewables, GSE - Gestore dei Servizi Energetici S.p.A.

■ Funding volume: public/private

Art. 42bis of decree-law 162/19 foresees that the Minister of Economic Development shall define the unitary value of an incentive tariff for the remuneration of RES power plants installed within the allowed configurations, whilst the Italian Regulatory Authority shall identify the value of the regulated network tariff components that are not technically applicable to shared electricity, when electricity is instantaneously self-consumed in the same portion of the low-voltage grid and, for this reason, is comparable to physical self-consumption on site.

Participants use the public grid to share with each other the electricity produced by the RES plants belonging to the configuration through the public grid. In this way, the construction of new private electricity grids is avoided, where they are not needed. In fact, a key principle underlying this transitional regime is to make the best possible and efficient use of the existing public grid.

In each hour, the shared electricity is equal to the minimum between the electricity produced and injected into the grid by the RES plants belonging to the collective scheme and the electricity withdrawn from the grid by the involved customers. Fig.3 shows a simplified chart that describes the way the shared energy is determined within the same multi-flat building: for each hour h , the “shared electricity” is:

$$\text{Shared electricity } (h) = \min_h \begin{cases} \sum_{i=1}^n E_{out_{i,h}} \\ \sum_{i=1}^n E_{in_{i,h}} \end{cases}$$

where:

- i is the i -th participant of the configuration (in red in the figure);
- $E_{out_{i,h}}$ is the energy withdrawn from the grid in a given hour h by the i -th participant;
- $E_{in_{i,h}}$ is the energy fed into the grid in a given hour h by the i -th participant.

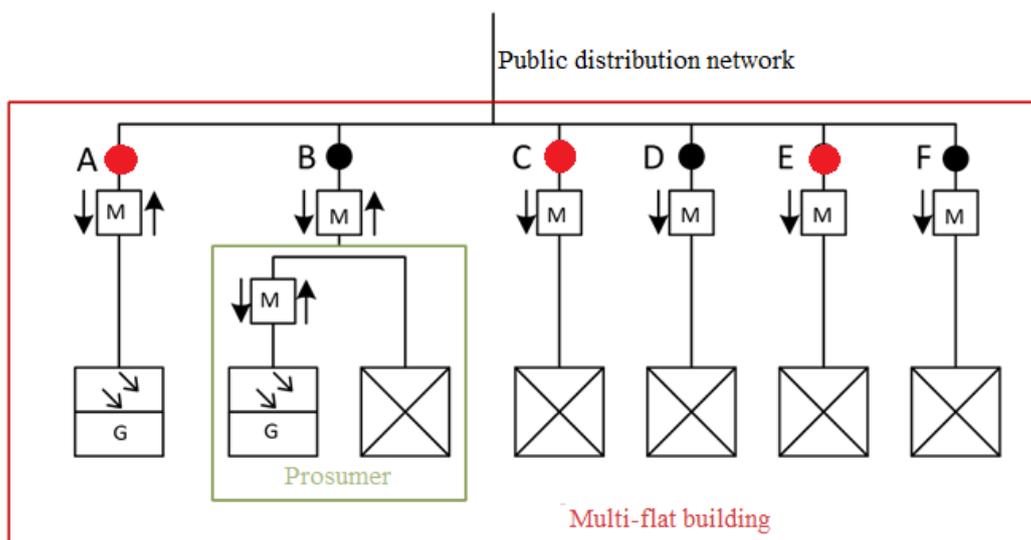


Figure 3: Energy shared among participants of a collective self-consumption scheme: in this example users C and E belong to the collective scheme together with the generation unit A.

The shared electricity, for each hour h , is an addition to the valuation of the self-consumed electricity; the contact person also receives from GSE the incentive defined by the Italian Government for the RES energy produced within collective self-consumption configurations.

This incentive was defined by the Minister of Economic Development, with ministerial decree 16th September 2020 [5]. It is equal to 100 €/MWh for the electricity self-consumed among jointly acting renewable self-consumers located within the same building, whereas it is equal to 110 €/MWh for the electricity shared within the REC. This support scheme is granted for 20 years, for both collective schemes.

■ Key lessons learned

Pilot regulation #2 on Self-consumption has just started and therefore no results concerning experiments are available. However, the initiative has attracted a lot of interest.

Self-consumption, along with Energy Communities, and the relevant regulatory approaches are becoming a “hot topic” in Italy, which is also addressed in a research project at national

level carried out by RSE - Ricerca sul Sistema Energetico. The project is aimed at promoting and closely following the first cases of implementation.

In this frame some publications are available (see for instance the dedicated “Dossier” [6]) and some public events are being organised. In particular, a public webinar was also held jointly by RSE and ARERA for the presentation of the results to the “Observatory for Regulation” [7], which was created as an innovative permanent way of listening and reporting on the work of the Authority by the national associations representing the stakeholders in a context of multilateral interaction.

Since the regulatory regime on collective self-consumption is still transitional, ARERA also asked RSE to develop a research on the effective saving of dispatching costs by collective self-consumption configurations.

References

- [1] President of the Italian Republic, decree-law 30th December 2019, n. 162
 - [2] President of the Italian Republic, law 28th February 2020, n. 8
 - [3] ARERA, Consultation document 1st April 2020, 112/2020/R/eel
 - [4] ARERA, Resolution 4th August 2020, 318/2020/R/eel
 - [5] Italian Minister of Economic Development, ministerial decree 16th September 2020
 - [6] DOSSIERSE “Gli schemi di Autoconsumo Collettivo e le Comunità dell’Energia”(RSE, 2020) [<https://dossierse.it/17-2020-gli-schemi-di-autoconsumo-collettivo-e-le-comunita-dellenergia/>]
 - [7] Osservatorio permanente della regolazione energetica, idrica e del teleriscaldamento [http://www.arera.it/it/osservatorio/home_osservatorio.htm]
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EXAMPLE OF REGULATORY EXPERIMENTING AND SANDBOX PROJECT IN THE POWER SECTOR

Title of Project	Pilot regulation #3: Smart charging of EVs at home (“private charging”)	
Location (Country/City)	Italy	
Main scope of experiment	Smart electricity grid, Smart charging of EVs at home	
Main innovation goal	New regulation, Facilitating EV smart charging at home (exploiting smart meter functionalities)	
Implementation Time Period	2021 > ongoing (until 2023)	
Funding Amount (direct and in kind)	Public	This pilot regulation is funded within ordinary tariff system as for network charges.
	Private	Private investments for EV recharge infrastructures at home (“wallbox”) are not subsidized with a State incentive.
Lead Organization	ARERA	
Additional Key Stakeholders/ Organizations	RSE – Ricerca sul Sistema Energetico (General-interest research institute in the energy sector) GSE – Gestore dei Servizi Energetici (State Agency for incentives for renewables)	
Link to Project’s Website/News	www.arera.it/it/elettricita/veicoli_ele.htm	

OVERVIEW OF THE PROJECT

In Italy, the Regulator has recently launched a new Pilot regulation to introduce a special arrangement for customers who recharge their own Electric Vehicles at home, in order to give a signal towards smart charging that takes advantage of the functionalities of smart meters (already rolled out over the whole national customer base, households included).

The initiative of the Regulator starts from the consideration that charging EVs at home is the most efficient way for both the consumer and the system, if the recharge of the EV battery is made during hours when the network is less loaded (night hours and Sundays/holidays).

■ Background

As a background, in Italy almost all household contracts for electricity supply foresee a nominal rated capacity of 3 kW, which implies a limitation to 3.3 kW for indefinite time and around 4 kW available for a maximum of 3 hours.

When the capacity limitation is reached, the breaker on the meter trips the circuit off and the customer can restart the supply by himself, after shutting off some of the appliances. If a customer needs further capacity – and this is almost unavoidable for a complete recharge of the batteries if other electricity appliances are run at the same time – the increase in rated capacity implies a one-off payment of around 77 euro per each extra kW as connection charge and an increase in the yearly network tariff of around 23 euro per extra kW of increased capacity (all figures are inclusive of 10% VAT).

Moreover, since 2009 electricity smart metering in Italy has provided consumption data splitted in 3 “timebands”, because ToU (Time of Use) energy price is mandatory in the default supply regime (and free in the free market). One of the timebands is known as “F3” and includes all night hours (from 11.00 pm to 7.00 am), plus all Sundays and holidays.

■ Overall objectives

The Pilot regulation provides an experimental framework in which EV owners may participate (on a voluntary basis) and obtain a special increase of capacity only during night hours, Sundays and holidays (the so called “F3” timeband). This opportunity is made possible by both first and second generation smart meters installed for all low voltage customers, and can be turned on by the DSO through a simple remote management operation on these specific delivery points.

The increase in night-time capacity does not involve a change in the contract and in the price (and therefore the tariff paid by the customer is exactly the same), because during all the rest of the time the nominal capacity remains set at 3 kW.

The pre-requisite for participating in the pilot regulation is to install a “wallbox” (charging infrastructure at home) capable of communicating with third parties, in order to enable further future developments, such as participation in aggregations for flexibility services (see Pilot regulation #1).

Customers that can prove to have a remote-communication capability on their wallbox obtain an increase of capacity for indefinite time up to 6.0 kW instead of 3.3 kW. Therefore they are allowed a full recharge of 24 kWh in 8 hours without any intervention of the capacity limitation breaker, maintaining the same total expenditure.

■ Types of key actors/organizations

The pilot regulation on EV smart charging at home was initially put into public consultation in 2019 by the Regulatory Authority [1], [2]. The initial proposal attracted a lot of interest and therefore a participative workstream was launched in 2020, namely the “Focus Group on EV recharge”, which was open to the participation of several associations dealing with electromobility. In this framework, the Focus Group conducted a survey on recharging infrastructures, including household wallboxes, that has been recently published [3].

■ Funding volume: public/private

There is no need for extra funding for this Pilot regulation. The cost of smart wallboxes is on EV owners. DSOs do not lose revenues.

GSE, the State-owned agency for renewables, has been appointed to collect request for participation and to check the features of wallboxes.

■ Key Lessons learned

Although the initiative has just started, also in the case of Pilot regulation #3 on EV smart charging at home the interest aroused has been really very high.

As already set up for Pilot regulation #2, a public seminar/webinar jointly held by RSE and ARERA is planned in the frame of the “Observatory for Regulation”, in order both to disseminate the initiative and promote participation and feedback from stakeholders.

The experimentation will last until 2023, when conclusions on the results will be drawn. Possible evolutions concern not only the maintenance of the “6 kW night regime” for EV charging, but also the extension to small scale domestic storage (in order to guarantee technological neutrality)

References

[1] ARERA, Consultation paper n. 318/2019/R/eel, part IV: Recharging of Electric Vehicles, July 2019. Available on the internet in Italian only: www.arera.it/allegati/docs/19/318-19.pdf

[2] ARERA, Consultation paper n. 481/2019/R/eel, Appendix C, Recharging of Electric Vehicles, November 2019, available on the internet in Italian only: www.arera.it/allegati/docs/19/481-19app.pdf

[3] ARERA, Focus group on the EV recharging, Report on recharging infrastructures, 2021 (*Mercato e caratteristiche dei dispositivi di ricarica per veicoli elettrici*, available on the internet in Italian only: www.arera.it/allegati/pubblicazioni/210503_dispositivi_ricarica.pdf)

LESSONS LEARNED AND NEXT STEPS OF THE PROGRAMME AND ITS PROJECTS

The Italian Regulatory Authority ARERA has recently devised and developed the tool of “Pilot regulation” in order to support innovation on a large scale in the power system. This tool is intended as an ex-ante regulatory framework defining a transitional regime to cope with a novel issue impacting the power system.

And indeed the three Pilot regulations that are being implemented in the last years in Italy touch upon topics that are at the core of the system transformation, entailing a real relevance and a great potential for change:

- **Pilot regulation #1:** Flexibility is needed to decarbonise the energy system, specifically considering the high percentage of RES in Italy (according to data from the Italian TSO TERNA, in 2020 37% of the load was covered with RES-generated electricity on a yearly basis, but – what is much more interesting – a maximum of 63% on a daily basis and - even more relevant - of 91% on an hourly basis).
- **Pilot regulation #2:** Collective self-consumption is becoming a very important opportunity towards democratisation [1] of the energy system, under the pressure of European directives.
- **Pilot regulation #3:** The electrification of individual mobility is possibly the most relevant driver for the “second electrification” contributing to decarbonisation in the transport sector.

Using unconventional regulatory schemes means being tuned with the paradigm of Dynamic Regulation brought forward by the Council of European Energy Regulators (CEER) [2].

ARERA experience since 2010 (see also the ISGAN Casebook - edition 2019) has shown that there is no one-size-fits-all model for regulators to deal with innovation: a “regulatory toolbox” of different types of experiments is needed. In this frame, a taxonomy proposal has been recently presented by ARERA to the CEER Distribution Systems Working Group (see Table 1), differentiating regulatory tools for supporting innovation on two axes: on the first axis, some tools are more oriented towards small-scale experiments (e.g. Pilot projects and Regulatory sandboxes), others towards large-scale (like Pilot regulations presented in this contribution); on the second axis, tools are classified according to the type of actors involved (only grid operators or both grid and market operators).

Large scale is actually the strong feature of Pilot regulations, along with being ex-ante and without need for approval. The Italian regulator - while considering the sandbox concept with interest – has for now deemed it preferable to extend Pilot regulations, since this is the approach that best guarantees the principle of non-discrimination and takes into account the problems referred to at p.t 12 of the conclusions of the Council of the European Union on “Regulatory sandboxes and experimentation clauses”:

“12. UNDERLINES that regulatory sandboxes and experimentation clauses always need to respect and should foster the application of the principles of subsidiarity and of proportionality, as well as of the precautionary principle. A high level of protection of inter alia citizens, consumers, employees, health, climate and the environment, as well as legal certainty, financial stability, a level playing field and fair competition always need to be ensured and existing levels of protection need to be respected” .

Table 1: The regulatory toolbox for innovation (source: Luca lo Schiavo and Iva Gianinoni, “ITALY’s Pitch - Regulation and Innovation”, ISGAN Regulatory Sandbox 2.0 project, Workshop #3)

	<i>GRID OPERATORS ONLY</i>	<i>GRID AND MARKET OPERATORS JOINTLY</i>
<i>LARGE SCALE</i>	REGULATORY EXPERIMENTS	PILOT REGULATIONS
<i>SMALL SCALE</i>	PILOT PROJECTS	REGULATORY SANDBOXES

Regulatory support to innovation in Italy is carried out in the interest of the system, that means both consumers and operators, and is always based on public consultations beforehand. The initiatives launched by ARERA considers the needs of the system from the start. Then ARERA regularly monitors the advancement of the projects, assesses the preliminary results and introduces corrective actions, if needed. Finally, project outcomes are made fully public, to enable external evaluation and dissemination of best practices.

Through this mechanism the final intervention of the regulator has sound bases and leads to significant shared changes or updates of current regulation. This was the case of the different experiments described in the ISGAN Casebook of 2019, which - being launched in 2010 – have achieved concrete and measured results, thus enabling innovative technological developments, business models and market opportunities.

The initiatives reported in this Chapter are extremely recent and not yet mature to provide definitive results. However, at least for Pilot regulation #3, a first result impacting on society has already been achieved in terms of participation to regulatory working groups (“focus group on e-mobility”) of associations engaged in electro-mobility, who were not used to cooperate with the energy regulatory authority.

Preliminary results of Pilot regulation #1 show that there is still a long way to reach efficiency in using DERs for ancillary services. This may depend upon some country-specific issues: for instance, traditionally in Italy electricity is not used for thermal usages (due to large diffusion of the natural gas network), and therefore there is less “slack” to be exploited by demand for providing services.

The implementation phases of the other two Pilot regulations (#2 and #3) started in 2020 and obviously no outcome is available so far. However, the experience gathered up to now shows that, when initiatives are directly linked to markets, such as Pilot regulations, the regulator can provide an adequate framework for experimentation, but true innovation should be pursued by market players. Therefore, the results of trials are by no means certain on an ex ante basis, but need to be monitored and evaluated both in itinere and ex post.

In the last period ARERA has launched a further regulatory innovation tool, namely the “Regulatory experiments”⁵, which (as reported in Table 1) involve only grid operators in large-scale developments. Results will be available for a possible next edition of the ISGAN Casebook.

References

[1] “Stable grid operations in a future of distributed electric power”, IEC White paper (2018) [\[www.iec.ch/basecamp/stable-grid-operations-future-distributed-electric-power\]](http://www.iec.ch/basecamp/stable-grid-operations-future-distributed-electric-power)

[2] “CEER Approach to More Dynamic Regulation”, Ref. C21-RBM-28-04, 08 April 2021 (www.ceer.eu/2050)

[3] “Council Conclusions on Regulatory Sandboxes and Experimentation Clauses as tools for an innovation-friendly, future-proof and resilient regulatory framework that masters disruptive challenges in the digital age”
[\[https://data.consilium.europa.eu/doc/document/ST-13026-2020-INIT/en/pdf\]](https://data.consilium.europa.eu/doc/document/ST-13026-2020-INIT/en/pdf)

⁵ A brief description is given in “CEER Approach to More Dynamic Regulation”, see [2]. In a nutshell, the main difference between Regulatory Experiments and Pilot regulations is that Regulatory experiments are aimed at DSOs only (whilst Pilot regulations include also market players) and the derogations are largely allowed upon request of DSOs, with approval of the regulator. The ex-ante framework of Regulatory experiments does exist, but is rather general and mostly principle-based, differently from Pilot regulations, which are quite developed in detail. In the first application of Regulatory experiments launched by ARERA in 2020-2021, distribution system operators can decide on their own whether and how to exploit the opportunity for proposing their own regulatory experiment and submit it to the Regulator for approval, including requests for derogation from ordinary regulation (the first application being focused on the quality of service regulation). The idea is that the Regulator grants to test a different regulatory scheme even on large scale (it is up to each DSO to decide how large the experiment is) and at the end of the experiment (lasting 4 years each) a lesson can be learned on how (and whether) to change the ordinary regulation.

2.8 NORWAY

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Program	Regulatory framework for pilot- and demonstration projects (Rammeverk for pilot- og demoprojekter)	
Location (Country/City)	Norway	
Main scope of experiment	<p>The framework covers all potential innovative projects that can contribute to a more efficient power system. It includes, but not limited to:</p> <p>Smart electricity grid (only electricity related), Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability , and Behind the meter.</p>	
Main innovation goal	New technological solution, product, service, new tariff-model, new business model, and new regulation	
Programme design	Advisory and clarification processes for innovators, experimentation space, and ex-post learning processes	
Regulatory body	The Norwegian Energy Regulatory Authority (NVE-RME)	
Implementation Time Period	2019 – ongoing, 10 exemptions granted as of Sep 2021	
Funding Amount (direct and in kind)	Public	Public funding possible under the Regulatory Authority's R&D Funding scheme: https://www.nve.no/reguleringsmyndigheten/bransje/bransjeoppgaver/finansieringsordning-for-fou/
	Private	Yes
Lead Organization	The Norwegian Energy Regulatory Authority (NVE-RME)	
Additional Key Stakeholders/ Organizations	N/A	
Link to Program's Website/News	https://www.nve.no/reguleringsmyndigheten/bransje/bransjeoppgaver/pilot-og-demonstrasjonsprosjekter/	
Contact Information	Name	Roar Amundsveen
	Email	roam@nve.no

2.9 SWEDEN

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Program	Regulatory Sandbox (in planning)	
Location (Country/City)	Sweden	
Main scope of experiment	Smart electricity grid (only electricity related), Integrated approach/sector coupling, Energy Storage, Flexibility services for grid stability, and Behind the meter The scope is not yet decided, all of the above options could be within the programme.	
Main innovation goal	New technological solution, product, service, New tariff-model, New business model, and New regulation The programme is not yet designed, all of the above innovation goals could be targeted.	
Programme design	Advisory and clarification processes for innovators, Experimentation space, and Ex-post learning processes	
Regulatory body	Swedish Energy Markets Inspectorate	
Implementation Time Period	In discussion as of 2020	
Funding Amount (direct and in kind)	Public	N/A
	Private	N/A
Lead Organization	The Norwegian Energy Regulatory Authority (NVW-RME)	
Contact Information	Name	Marielle Lahti
	Email	marielle.lahti@ei.se

Sweden is currently discussing the introduction of a regulatory sandbox programme within the regulatory mandate of the Swedish Energy Markets Inspectorate. The design and scope of the potential programme is not yet decided as the regulator is, inter alia, awaiting changes in legislation.

2.10 UNITED KINGDOM

REGULATORY EXPERIMENTING AND SANDBOX PROGRAMME

Title of Programme	OFGEM's Innovation Link	
Location (Country)	Great Britain	
Main scope of experiment	<p>Ofgem's Innovation Link provides energy regulation support to businesses looking to trial or launch new products, services, methodologies or business models. It offers feedback on regulatory issues and grants regulatory sandbox support on a case by case basis in instances where current regulation might prevent a proposition that is beneficial to consumers. The sandbox responds to market-led innovations, rather than specifying innovation or business model types. The sandbox has supported:</p> <ul style="list-style-type: none"> - Behind the meter services - Innovative tariffs - P2P and local electricity trading trials 	
Main innovation goal	New technological solutions, products, services or methodologies, New tariff-model, and new business model	
Implementation Time Period	<ul style="list-style-type: none"> - Launch: December 2016 - 1st call: February 2017 - 2nd call: October 2017 - Open on-demand service: Revised service launched in July 2020 	
Funding Amount (direct and in kind)	Public	The Innovation Link does not offer funding for trials, however, applicants may apply for public funding from other schemes
	Private	Yes
Lead Organization	OFGEM – Office of Gas and Electricity Markets	
Additional Key Stakeholders/Organizations	GB industry code bodies – Elexon (Balancing and Settlement Code), Electralink (Distribution Connection and Use of System Agreement),	
Link to Programme Website/News	https://www.ofgem.gov.uk/about-us/how-we-engage/innovation-link https://www.ofgem.gov.uk/publications-and-updates/regulatory-sandbox-repository https://www.ofgem.gov.uk/system/files/docs/2020/07/sandbox_guidance_notes.pdf	
Contact Information	Name	Kevin Baillie
	Email	kevin.baillie@ofgem.gov.uk

BACKGROUND AND OVERVIEW

The energy system, and how we use it, is changing, but that transformation needs to accelerate in order to drive a massive shift in how we produce and consume energy. The impact of COVID-19 have given us further insight into what a low-carbon future might look like, with consumer demand patterns changing as more people work from home, with greater reliance on renewable generation as a result of lower levels of industrial demand.

We all know that we're standing at the edge of a system transformation and that innovation will have a central role in remaking our energy landscape. Over time, as the system transitions, the rules that govern it will evolve too. Ofgem is driving forward a series of reforms to create a greener, fairer and smarter energy system, including changes to electricity network charging and settlement arrangements, whilst promoting a whole system approach to energy, including cross vector considerations and digitalization of the sector.

But, where an innovator wants to trial something novel, or launch a new business now, some rules might be 'barriers' to making this happen. The rulebook rightly sets the high standards we expect of an essential service, but that's not to say that the rules are perfect or should be static, or that they will always be capable of delivering the outcomes we want. To remain relevant in the face of rapid, technology-driven system change, regulators need to harness new perspectives and tools. We need to complement strategic reforms with approaches which allow us to keep pace with innovation. While the current framework employs prescriptive and principle-led approaches, we know that prescription lacks the foresight and adaptability of principles, meaning that we need complementary tools to enable innovations blocked by current rules that can benefit consumers.

That's why we developed the Sandbox: to allow innovators to experiment and bring propositions to market, while continuing to protect consumers. The Sandbox complements strategic reforms by letting innovators trial or launch new products, services and business models without some of the usual rules applying. It also lets us work with innovators to gather evidence to inform permanent reform.

These can be rules that Ofgem controls (usually in licences) or, in some circumstances, from the rulebooks (codes) owned by industry, which underpin the day-to-day operations of the energy system. The Sandbox offers a range of tools to innovators across all the areas we regulate, including suppliers, generators and network companies, and even those who aren't directly regulated by us – for example third party intermediaries and energy services providers.

■ **The Sandbox**

Ofgem's Innovation Link manages the Sandbox, a demand-led service, open to businesses looking to trial or bring to market new products, services, methodologies or business models. It acts as the single point of entry for innovators who also wish to use regulatory flexibility available in industry codes, initially covering the Balancing and Settlement Code (BSC)

Distribution and Connection Use of System Agreement (DCUSA) and the Retail Energy Code (REC).

The sandbox can support temporary trials, or permanent undertakings. For Ofgem to grant sandbox support we need to be satisfied that a proposition meets the eligibility and desirability criteria, namely that:

- a. The proposal is genuinely innovative. This means that the product, service or methodology is not already being offered in the market or the business model being used to deliver the service or product is new and sufficiently different.
- b. The innovation has potential to deliver consumer benefits and consumers will be protected during the trial; any potential risks are not transferred from the innovator to consumers; we may put safeguards in place to preclude this happening.
- c. A regulatory barrier inhibits the progress of a trial. Ofgem, the government (the Department for Business, Energy, and Industrial Strategy) and a number of other industry bodies oversee different parts of the market and regulatory arrangements. As such, Ofgem cannot commit to being able to remove all of the barriers that are identified. However, where possible we will assist innovators in bridging the gap with relevant bodies.
- d. The proposal supports the decarbonisation of GB, as we progress on our path to Net Zero.

■ **What the Energy Regulatory Sandbox is not**

The sandbox enables companies to trial or launch new products, services and business models in a real world application. It is not a means for innovators to change policy or regulation on a permanent basis, although we will use the insights arising from the schemes supported to inform policy. To make permanent changes we have to follow appropriate processes and make them available to all parties.

Unlike other sandbox practicing countries, our regulatory sandbox is not (yet) a mechanism to try out new regulations. Sandbox propositions must centre on the trial (or where suitable, deployment) of an innovation, rather than the application of new regulations. We do, though, believe there can be merit in these approached and will be considering the potential for policy-led sandboxes to test different approaches to regulation in controlled circumstances. looking at the potential

■ **The Sandbox offer**

At a very high-level, the Sandbox can support innovators in delivering trials, or entering the market with a new product, service, business model or methodology. Innovators can pick from one, some or all of the available tools:

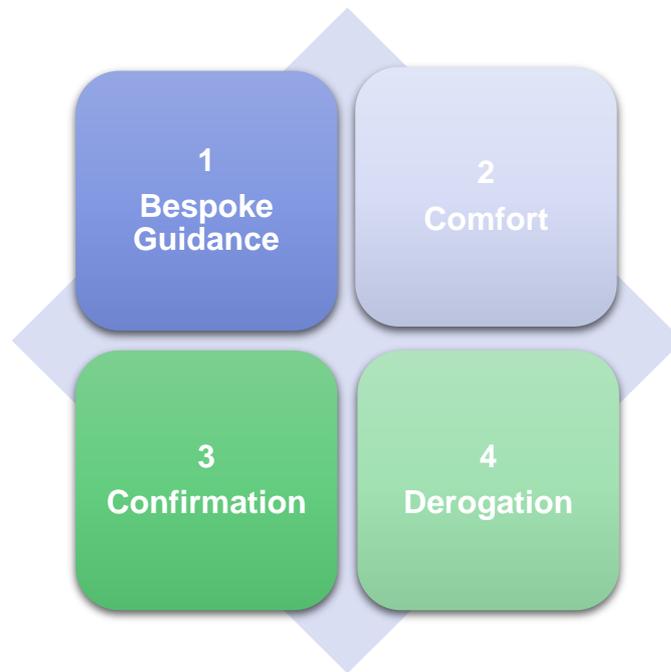


Figure 4: Tools that the sandbox can offer innovators

1. Bespoke guidance - The Sandbox can provide bespoke guidance and certainty about specific rules in particular situations. Bespoke guidance is provided bilaterally to the innovator for the purposes of their trial.
2. Comfort - Where an innovator assesses the risk of non-compliance to be too high, the Sandbox could, for the purposes of the trial, provide comfort about what we consider to be compliant behaviour, and our approach to enforcement.
3. Confirmations - The Sandbox won't endorse a specific product or business, but to address this uncertainty it can confirm whether (and within which framework) a type of activity is permissible.
4. Derogations (a derogation is permission for someone not to comply with a rule) – Derogations can be from both Ofgem regulations, and from some industry codes.

We expect that innovators undertaking trials will most likely seek bespoke guidance, comfort and possibly derogations. For market entry, we expect confirmations and derogations are likely to be more suitable, as they can provide for longer-term certainty

LESSONS LEARNED AND NEXT STEPS

■ **Service Development: from Sandbox 1.0 to version 2.0**

The Sandbox service has evolved from the initial offer in 2017, to that available in 2021. It has evolved to reflect our experience of the original Sandbox and what innovators told us they needed. As well as wanting more explicit support to aid market entry, innovators said that it's important that the limitations of the Sandbox are made clear so they can make informed judgements about resources and risk. In 2017 we ran two Sandbox application windows; through these we worked with 68 innovators to explore and develop sandbox trials. The key things we learned and how we've adapted the service are summarised below:

How the Sandbox has evolved		Table 1
Insight		New Sandbox
Innovators want to access the Sandbox at time of need		<ul style="list-style-type: none"> An on-demand service is preferred. An innovator's stage of development determines timing of request. Innovators not 'forced' to ask for support too soon, through fear of an application window closing.
Scope of rules covered, too narrow		<ul style="list-style-type: none"> Sandbox now includes code tools: BSC and DCUSA. Retail Energy Code building-in sandbox flexibilities. Innovation principle adopted by the codes through their collective Code of Practice (CACoP) We are looking to extend the number of rules in the supply licence that we can derogate from.
Innovators want to launch businesses, not just do trials		<ul style="list-style-type: none"> Sandbox will confirm whether non-traditional types of activity are permissible. Derogations available to support market entry.
Start-ups want to signal low regulatory risk to investors		<ul style="list-style-type: none"> Sandbox will confirm whether non-traditional types of activity are permissible.
Innovators want clarity about the support available		<ul style="list-style-type: none"> Guidance is explicit about the scope and coverage of the Sandbox service. Clear criteria for Sandbox service and tools.
Innovators often need guidance, not sandboxes		<ul style="list-style-type: none"> Innovators access feedback if not sandbox-ready. We will publish general guidance on common use-cases / issues arising from the feedback service. Where possible, we will publish details of activities that we have confirmed as permissible, so this is available to others.

Figure 5: Summary of Sandbox version 2.0

One of the main changes is the range of tools available. The BSC and the DCUSA both have sandbox capabilities for innovations in electricity markets. The Retail Energy Code (REC) is bringing together code requirements relating to retail energy activities, and is building-in sandbox flexibilities; in 2021 it will consolidate the meter point registration systems for the gas (Supply Point Administration Agreement) and electricity (Master Registration Agreement) markets. While the Sandbox doesn't have complete electricity code coverage, there are opportunities to evolve and expand this over time.

■ **Insights/Policy Development**

Our sandbox is a demand-led service that is actively helping innovators trial/launch their propositions, delivering value to the GB energy market. Our support is conditional on the innovator surfacing relevant insights for either;

- Ofgem
- Government
- Industry
- Other innovators

Learnings from the currently supported sandbox schemes have yet to formally emerge. We are considering the value of adding a policy sandbox to our suite of tools. This may help drive up policy value of our offerings, and implement targeted change to the energy system.

■ **Sandbox evolution: Sandbox 3.0?**

The Innovation Link has published an independent evaluation of its services; this will inform consideration of how the Link's services (including the sandbox) should evolve. For more information on our evaluation, please follow this link:

<https://www.ofgem.gov.uk/publications/innovation-link-evaluation-and-evolution-request-feedback>