

# CEER

**Council of European  
Energy Regulators**



Fostering energy markets, empowering **consumers**.

## **“Dynamic NRAs to Boost Innovation”**

**(Report on NRAs’ experiences and  
recommendations on Dynamic Regulation)**

**Regulatory Benchmarking Workstream**

**Ref: C22-RBM-37-04**

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## INFORMATION PAGE

This report is based on a case studies and a study carried out for CEER by CEPA, Queens House, 55-56 Lincoln's Inn Fields, London WC2A 3LJ, United Kingdom [www.cepa.co.uk](http://www.cepa.co.uk).



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## Abstract

This document (C22-RBM-37-04) presents the state of play of Dynamic Regulation from NRAs' perspective. It highlights the understanding, main developments and approaches of Dynamic Regulation in the energy sector.

The document seeks to support discussions on CEER's strategy. The aim of this deliverable is to provide a state of play in terms of "if" and "how" NRAs deal with Dynamic Regulation in a transversal perspective. It is intended to serve as a background paper as a scoping exercise on CEER Guidelines of Good Practice on Dynamic Regulation.

## Target audience

National Regulatory Authorities (NRAs), European Commission, Member States, academics and other interested parties, ACER.

## Keywords

Dynamic Regulation; Digitalisation; Regulatory Sandbox; Innovation; Case studies; National Regulatory Authorities (NRAs), cooperation, consumer interests.

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## Related documents

### CEER Documents:

- [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), XX May 2022, Ref. C21-DS-74-04.
- [CEER Report on Innovative Business Models and Consumer Protection Challenges](#), 20 September 2021, Ref. C20-CRM-DS-03-03.
- [CEER Approach to More Dynamic Regulation](#), 8 April 2021, Ref. C21-RBM-28-04).
- [CEER's 3D Strategy \(2019-2021\)](#) – Digitalisation, Decarbonisation, Dynamic regulation: CEER's 3D Strategy to foster European energy markets and empower consumers Conclusions Paper, 9 January 2019, Ref: C18-BM-124-04.

### ACER-CEER Documents:

- [The Bridge Beyond 2025 Conclusions Paper](#), 19 November 2019.

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## EXECUTIVE SUMMARY

Following the publication of the Bridge to 2025 Conclusions Paper<sup>1</sup>, CEER decided in 2018 to re-assess how to address the challenges that energy regulators are facing, particularly in the context of the energy transition. This was done by publicly consulting on a forward-looking three-year strategy (the “3D Strategy”<sup>2</sup>). In April 2021, CEER published a short note on an approach to more Dynamic Regulation with a brief analysis of the status of Dynamic Regulation in the regulatory environment. Continuing its engagement in the topic, on 25 May 2022, CEER also published a paper on regulatory sandboxes in incentive regulation in the context of distribution system operator (DSO) regulation.<sup>3</sup> In addition, CEER has engaged the consulting firm CEPA<sup>4</sup>, which was tasked to assess and evaluate current Dynamic Regulation energy projects in a broader scope.

The current report is based on the study performed by CEPA and consists of two parts. In part one, the regulatory approaches taken by national regulatory authorities (NRAs) are analysed. In part two, the case studies are described in a detailed way. The report summarises the regulatory approaches taken in some EU Member States (MS) and in two non-EU countries to facilitate innovation in the energy sector and to apprise regulators and policymakers on the need for regulatory reforms that would support the transition to a decarbonised economy. **Dynamic Regulation is expected to remain an important part of the regulatory “toolbox” as part of the energy transition.**

Therefore, in this report CEPA makes **recommendations** to inform the implementation of Dynamic Regulation initiatives by highlighting the commonalities in the approaches taken and the differences that reflect each country’s specific circumstances.

The economic regulation of energy services is characterised by a tension between the **need for stability and predictability** and the **need to evolve over time** to reflect the changing fundamentals of the energy system driven by climate change and technological innovation. The transition towards a decarbonised energy sector is a clear example in which aforementioned tensions play out. Legislative changes at EU level – such as the European Commission’s ‘Fit for 55’ package<sup>5</sup>, Energy System Integration Strategy and Gas Decarbonisation proposals<sup>6</sup> – feed through into domestic legislation. NRAs must be responsive to these changes while keeping the energy sector’s regulatory framework stable.

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<sup>1</sup> [EU Agency for the Cooperation of Energy Regulators \(ACER\) A Bridge to 2025 Conclusions Paper](#), 19 September 2014.

<sup>2</sup> [CEER’s 3D Strategy \(2019-2021\), Ref: C18-BM-124-04](#), 9 January 2019.

<sup>3</sup> [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022

<sup>4</sup> CEPA (formal name Cambridge Economic Policy Associates) is an economics, finance, competition and regulation advisory firm whose staff and associates have extensive experience in advising regulators, governments, companies and consumer representatives on the transition to a low carbon economy. Further information is available on [www.cepa.co.uk](http://www.cepa.co.uk).

<sup>5</sup> European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions, accessed at: [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_21\\_3541](https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541)

<sup>6</sup> Powering a climate-neutral economy: Commission sets out plans for the energy system of the future and clean hydrogen, accessed at: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1259](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1259)

Dynamic Regulation can be considered the way in which NRAs balance that tension – by allowing regulation to evolve over time, but doing so in a way that is predictable and helps maintain the stability of the overall regulatory arrangements. Different approaches to Dynamic Regulation are used in different countries and in different contexts, but the common feature is that they allow for the exploration of a new technology, service or regulatory approach in a low-risk environment in order to inform future regulatory reforms.

For the purposes of this report, the following definition of Dynamic Regulation is applied:

**A regulatory approach that is limited in time, focused on the energy sector activities it covers and/or the energy sector actors who can participate, and which aims to cope with some kind of novelty in the energy system with the ultimate goal of informing future regulatory decision-making through experimentation.**

In addition to the already-defined recommendations in the CEER paper on regulatory sandboxes,<sup>7</sup> two sets of recommendations are made here for NRAs to better implement Dynamic Regulation tools. The first set relates to the **common features that all Dynamic Regulation initiatives must have in order to be successful**,<sup>8</sup> forming the foundations of effective public policy, and are especially relevant for the types of challenges which Dynamic Regulation seeks to find innovative solutions for:

- There needs to be an **enabling legal framework**.<sup>9</sup> In countries where the NRA has broad discretion under the legal framework, Dynamic Regulation may be introduced without the need for further changes. In other cases, legislation would need to be adapted to make these types of experiments possible. It is also important that there be clarity on the role of the NRA, which should be aligned with the NRA's competencies. This is especially important in countries where competencies are split between the NRA and other organisations (e.g. Ministries).
- There needs to be **clarity on the objectives of the Dynamic Regulation initiative**. The objectives may be very broad (e.g. enabling cost-effective decarbonisation through the use of new technologies) or may be very narrow (e.g. resolving a technical issue at a particular location on the network), but in all cases these objectives must be clearly stated in order to ensure that actions by the NRA, energy sector participants, and other stakeholders are all guided towards a shared outcome.
- The **process for granting Dynamic Regulation and the approval criteria need to be well defined**.<sup>10</sup> There should be clarity on whether approval is to be granted on a case-by-case basis or whether a broad exemption is introduced to allow for the experimentation (the latter is sometimes referred to as *ex ante* approval). The eligibility criteria and the information that the NRA<sup>11</sup> requires in order to approve a request for a Dynamic Regulation

<sup>7</sup> [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

<sup>8</sup> [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

<sup>9</sup> See also chapters 5.2 and 5.3 of [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

<sup>10</sup> See also chapter 5.4(b) of [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

<sup>11</sup> Or another competent authority, as applicable.



initiative should be clearly set out upfront, so that applicants are able to make high-quality submissions.

- NRAs must ensure that any Dynamic Regulation initiative includes **appropriate consumer protections**. Innovation necessarily involves a higher degree of risk and likelihood of failure than regulators would typically be comfortable with. Dynamic Regulation can help bridge that gap by building in upfront consumer protections and/or redress should the innovation turn out to have undesirable impacts.
- **Clear and extensive communication and support**.<sup>12</sup> Applicants are likely to require support both in preparing their applications and in bringing their projects to life. There will also be a need for the NRA<sup>13</sup> to promote the introduction of the Dynamic Regulation initiative and to explain its objectives and the process involved.
- **Reporting, monitoring and evaluation** need to be planned from the outset. A distinctive feature of Dynamic Regulation is that the trials and experiments are intended to inform (the need for) future regulatory and/or legislative reform – e.g. to provide the NRA with new responsibilities or to introduce new forms of consumer protections.
- Successful delivery of Dynamic Regulation initiatives requires sufficient **resourcing of the NRA**,<sup>14</sup> and of participating stakeholders. There is consistent evidence that undertaking Dynamic Regulation requires ongoing resourcing to enable effective development, engagement, assessment and monitoring of the initiatives.

The second set of recommendations relate to the fact that there are many different options for implementing Dynamic Regulation. No one option is clearly superior to all others – the decision on which option to use depends on local circumstances such as market structure, and on the objectives of the initiative. Therefore, **the options available across five elements of Dynamic Regulation are highlighted in this report:**

- **The degree of NRA involvement**.<sup>15</sup> NRAs play different roles and have different competencies in the Dynamic Regulation approaches. In some cases, they are the driving force behind the initiative (e.g. in Italy and Ireland); in others they are a facilitator of a service that is led by innovators, sometimes referred to as being demand-led (e.g. in France and Lithuania); and in a few cases the NRA has a limited role or is primarily an observer of Dynamic Regulation led by another entity (e.g. in the Netherlands). So far, there is no evidence to suggest that Dynamic Regulation initiatives led by NRAs were more or less effective than those in which the NRA played more of a facilitating role.
- **The scope of activities**. The Dynamic Regulation approaches discussed in this report ranged from covering a very specific energy-related activity to covering a potentially very broad range of activities in the energy sector (e.g. the sandboxes in Lithuania and Great

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<sup>12</sup> See also chapter 5.4 of the [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

<sup>13</sup> Or another competent authority, as applicable.

<sup>14</sup> And/or any other competent authority, as applicable.

<sup>15</sup> See also chapter 5.1 of the [CEER Paper on Regulatory Sandboxes in Incentive Regulation](#), Ref: C21-DS-74-04, 25 May 2022.

Britain). The scope of activities covered by a Dynamic Regulation initiative may be a function of the legal framework that applies, or a reflection of the aims of the initiative. The activities most commonly featured in the case studies related to the energy transition: integration of electric vehicles, household provision of flexibility services, participation in balancing services, local energy communities and peer-to-peer trading, and hydrogen use in gas networks. Dynamic Regulation that is participant-led tends to have a broader scope, in order to allow for a wider set of innovations to be proposed. NRA-led Dynamic Regulation initiatives typically have a narrower scope, reflecting the fact that the NRA is typically aiming to find a solution to a specific problem that has been identified.

- **Funding.** The provision of funding to support the innovation, or the access to performance-related incentive payments, is a feature of some Dynamic Regulation initiatives. Such payments are more often offered to network operators, as this forms a natural complement to the setting of regulated tariffs. Since such funding ultimately comes from energy consumers, NRAs that provided funding for Dynamic Regulation have included back-stops that recover (a share of) the funding if the network operator has not met the targets of the initiative. Funding is also temporary and only provided while the trial is operating.
- **The type of participants involved.** Dynamic Regulation approaches differ depending on whether the (primary) participants are regulated network operators, incumbent market participants, or new entrants. This would depend on the aims of the Dynamic Regulation, given the separation of roles within the energy system. This issue also interacts with the legal framework for the Dynamic Regulation – for example, it may be possible to implement initiatives that are only open to the transmission system operators (TSOs) or DSOs through standard tariff regulation processes.
- **The primary aim.** All Dynamic Regulation approaches seek to promote innovation (whether technical or in regard to the regulatory process) and to inform future regulatory reforms. However, the balance of emphasis between the two may be different in different circumstances. This is typically reflected in the extent to which information from the Dynamic Regulation initiative is required to be made public.

This report presents detailed case studies of the approach to Dynamic Regulation from France, Ireland, Italy, Lithuania, the Netherlands and Portugal. In addition, case studies from outside the EU were analysed: one each from Australia and Great Britain. The approach taken in each case study reflects local circumstances and objectives. The following table displays the main outcomes of the assessment:

Country	Case study	Degree of NRA involvement	NRA's role	Scope of activities	Type of participants involved	Funding
France	Regulatory Experimentation System	NRA as facilitator	Initiates application window; Assesses eligibility of applications; Determines who is the competent authority to award a derogation; Grants derogations where it is the competent authority; Evaluates projects and identifies need for regulatory changes	Limited to access and use of networks	Any participant (e.g. energy supplier, EV charging operator), as long as project involves access or use of networks	Projects are privately funded <sup>€</sup>
Ireland	Strategic Innovation Fund	NRA driving the process	Created the mechanism; Determined the level of available funding; Evaluated the DSO's performance and decided on any claw-back of funding for underperformance by the DSO	Low-carbon energy projects and DSO's own innovation capabilities	The fund was only available to the DSO	€20 million each year of the regulatory period, subject to claw-back for under-delivery of innovation projects
Italy	Regulatory experiment on DSO quality of service incentive	NRA driving the process	Created the mechanism and invited applications from DSOs; Assessed DSOs' applications; Monitors participating DSOs' performance and determined rewards/penalties; Evaluates need to extend derogations granted	Regulatory experiment limited to the reliability incentive	Available to DSOs	Funding provided through electricity distribution tariffs, in the form of incentive rewards / penalties
Lithuania	Energy innovation pilot environment	NRA as facilitator	Assesses applications, including eligibility; Grants exemptions; Monitors projects that have been granted an exemption; Evaluates completed projects and identifies need for regulatory changes	Open to all activities in electricity, gas and district heating	Open to regulated network companies (DSO, TSO) and unregulated companies (retailers, innovators)	Rewards available for successful projects, such as a WACC premium for DSO/TSO projects – funded through network tariffs
Portugal	Regulations enabling pilot projects	NRA driving the process in response to stakeholder interest	Identifies the activities for which pilot projects should be permissible and amends the regulations to enable such pilots; Assesses applications; Grants derogations; Evaluates pilot projects and identifies need for regulatory changes	Specific activities such as dynamic network tariffs and participation of consumers in the reserve market	Each pilot involves different participants. Some of the participants involved in pilots to date include the TSO, suppliers and energy communities	Projects are privately funded <sup>€</sup>
The Netherlands	Energy experimentation law	Limited involvement by the NRA	Once a project had received an exemption from the Netherlands Enterprise Agency (RVO) to operate within the sandbox, the NRA's role was to approve the tariff methodologies proposed by project developers	Limited to energy community initiatives	Open to energy communities (cooperatives or housing associations) with a connection to the DSO	Projects are privately funded <sup>€</sup>
Australia	New Reg Trial	NRA as facilitator	Approved the scope of negotiations; Provided technical and economic support to the Customer Panel; Assessed the DSO's proposal in line with standard regulatory process	Limited to the tariff-setting process	Open to electricity DSOs	DSO's costs of running the trial funded through electricity distribution network tariffs
Great Britain	Ofgem's Innovation Link (regulatory sandbox)	NRA as facilitator	Created the sandbox service; Provides guidance to innovators on interpretation and compliance with regulation; Initially invited applications within a 'window' but now receives application on an ongoing basis; Assesses applications; Grants exemptions; Facilitates involvement of Code Administrators where derogation requests relate to industry codes; Monitors and evaluates projects	Open to all energy activities under Ofgem's remit	Any participant, as long as they are licensed to carry out an energy sector activity (e.g. DSO, TSO, supplier/retailer, aggregator). Some projects have been led by unlicensed innovators who partnered with a licensee	Projects are privately funded <sup>€</sup>

*Table 1: Summary of case study characteristics*

Source: CEPA review of case studies

Note: € signifies projects that are privately funded (i.e. no funding is provided as part of the Dynamic Regulation itself) may still be able to access funding from national and European sources – such as the EU Horizon 2020 programme.

At the time of conducting this study, many of the Dynamic Regulation initiatives had not yet led to live project trials. As such, evidence on the impact of Dynamic Regulation is mostly limited to the design, implementation and process involved in Dynamic Regulation, rather than direct impacts on energy consumers. Nevertheless, hereafter are some lessons, in a nutshell, that individual NRAs have learnt based on their Dynamic Regulation experience:

- In Great Britain, innovators often needed relief from industry codes. Enabling sandboxes at the level of industry codes could be a next step.
- In Great Britain, the sandbox was initially run for electricity only. It is planned to extend the sandbox to gas and to more license elements to make it more accessible.
- In Australia, the trial revealed a number of limitations on the price reviews such as a 'blind spot' in relation to service standards. This insight was used to inform changes to the rules. Also, the fact that the NRA did not have the legal leeway to implement the results of the trial led to a revision of the guidebook for price reviews.
- In the Netherlands, the legislator is currently considering introducing in law an automatic exemption for small suppliers (less than 500 customers).
- In the Netherlands, the sandbox trials have led to a different approach to network tariff reform: currently, there are two DSO-led working groups exploring a tariff reform.
- In general, Applicants need to specify which regulations currently act as a barrier to their proposed innovation. This kind of specificity helps both sides.
- The Irish, Italian and Lithuanian cases found that where a single entity (e.g. the NRA) plays the central role in enabling the Dynamic Regulation initiative, the main advantages observed were clarity on responsibilities and on who has the decision-making power; clarity on whom innovators need to approach; ability to pursue a specific objective or agenda; and clear accountability.

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## 1 Introduction

This section of the report briefly sets the context for this work, before providing a definition for Dynamic Regulation and describing the study's methodology.

### 1.1 Context

The economic regulation of essential services, such as energy, involves a tension between two requirements inherent to an NRA's functioning:

- On the one hand, **regulation needs to be stable and predictable** in order to facilitate investment in long-lived assets such as energy networks and generation plants. Stability and predictability are also important for enabling business models that provide consumers with essential services, such as access to reliable energy supply.
- On the other hand, **regulation necessarily needs to evolve over time**. This is because the fundamentals of the energy system, driven by climate change and technological innovation, change. With the change in fundamentals come new and reformed European and national policies and guidelines, with which energy regulation must be aligned.

The drive towards decarbonisation is one example in which the above tensions are especially clear. The global commitment to decarbonise economic activity – as set out in the 2015 Paris Agreement – has led to (proposed) legislative changes as reflected most recently in the European Commission's 'Fit for 55' package,<sup>16</sup> the Commission's Energy System Integration Strategy and Hydrogen Strategy,<sup>17</sup> and the Hydrogen and Decarbonised Gas Package.<sup>18</sup>

Coupled with these legislative changes is the emergence of new business models that challenge regulatory treatment geared towards traditional centralised energy systems. Even when NRAs themselves are not at the forefront of technological change or decarbonisation policies, they have an important role to play in enabling progress and ensuring that regulatory regimes continue to be fit for purpose.

### 1.2 The need for Dynamic Regulation

Dynamic Regulation can be considered the way in which NRAs balance the aforementioned tension by allowing regulation to evolve over time, while doing so in a way that is predictable and while keeping the regulatory framework stable.<sup>19</sup>

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<sup>16</sup> European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions, accessed at: [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_21\\_3541](https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541)

<sup>17</sup> Powering a climate-neutral economy: Commission sets out plans for the energy system of the future and clean hydrogen, accessed at: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1259](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1259)

<sup>18</sup> Commission proposes new EU framework to decarbonise gas markets, promote hydrogen and reduce methane emissions, accessed at: [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_21\\_6682](https://ec.europa.eu/commission/presscorner/detail/en/IP_21_6682)

<sup>19</sup> A report for the European Parliament's committee on Industry, Research and Energy (ITRE) concluded that "policies should leave room for numerous and sufficiently sizeable regulatory and technology experimentation". See: Zachmann, G.; Holz, F.; McWilliams, B.; Meissner, F.; Roth, A.; Sogalla, R.; Kempfert, C., (2021), *Decarbonisation of Energy*, Publication for the ITRE, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament. Accessed at:

[https://www.europarl.europa.eu/RegData/etudes/STUD/2021/695469/IPOL\\_STU\(2021\)695469\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/695469/IPOL_STU(2021)695469_EN.pdf)

The need for Dynamic Regulation is not new; it has existed for a number of years. Over this period, NRAs have used different tools to support innovation, open up markets, facilitate investment in low-carbon technologies, and improve their own regulatory processes. Certain trends and concepts have emerged in this process, making the present an opportune time to systematically review the different approaches to Dynamic Regulation and learn for the future.

CEER's Regulatory Benchmarking Work Stream has made progress over the past couple of years in building up a knowledge base on Dynamic Regulation. Two key outputs of that work to date have been the Note on the Approach to More Dynamic Regulation<sup>20</sup> and the creation of a Platform for Exchange<sup>21</sup> on CEER's website. The former sets out the case for Dynamic Regulation, identifies some of the main approaches used by NRAs to date, and lists a number of examples of Dynamic Regulation. The latter collates relevant publications and links to presentations from a workshop on Dynamic Regulation that took place on 25 June 2021.

### 1.3 Description of Dynamic Regulation

As of yet, there is no consensus definition of "Dynamic Regulation" or of the activities that could be categorised as such.<sup>22</sup> This presents a barrier for NRAs' and stakeholders' ability to learn from others' past experience. To aid best practice decision-making by NRAs on future Dynamic Regulation activities, there is a need to establish a common understanding and to draw out a kind of "decision process" through which the most suitable Dynamic Regulation activity can be identified for a given set of circumstances. To this end, CEER have used the following definition of Dynamic Regulation in preparing this report:

**A regulatory approach that is limited in time, focused on the energy sector activities it covers and/or the energy sector actors who can participate, and which aims to cope with some kind of novelty in the energy system with the ultimate goal of informing future regulatory decision-making through experimentation.**

This definition is informative in terms of helping to draw a clear line between what can be considered Dynamic Regulation and what would rather belong to the normal evolution of regulatory framework: 1) a broader regulatory reform, which is not limited in time, 2) case-specific regulation<sup>23</sup>, which is limited in time and/or its coverage but is not aimed at informing future reforms, and 3) changes to the regulatory process that are not linked to experimentation of innovation but simply to the obligatory tasks of NRAs.<sup>24</sup>

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<sup>20</sup> CEER Approach to More Dynamic Regulation (C21-RBM-28-04), accessed at:

<https://www.ceer.eu/documents/104400/-/-/70634abd-e526-a517-0a77-4f058ef668b9>

<sup>21</sup> The platform also provides a Dynamic Regulation newsletter subscription that provides updates and can be used by any interested party. See: CEER fit for innovation through Dynamic Regulation. Accessed at:

<https://www.ceer.eu/dynamic-regulation>

<sup>22</sup> Note that the term 'dynamic regulation' has a different meaning in the context of the technical operation of the electricity system within a target range of electrical frequency.

<sup>23</sup> Examples of case-specific regulation include differential treatment of a particular project or investment, and the treatment of a part of the energy system that is geographically remote or not connected to the main system.

<sup>24</sup> E.g. changes in the regulatory process, aimed, for instance, at strengthening the consultation process or the cooperation with other public authorities when these initiatives are simply linked to (i.a.) the accountability of NRAs. Under this conception, Innovation Hubs can be considered a Dynamic Regulation case.

## 1.4 Methodology used in this report

This report uses case studies to provide an in-depth review of different applications of Dynamic Regulation in the energy sectors of several EU Member States (MS), as well as two non-EU countries. The case studies were produced through a combination of literature review, interviews with staff from the respective NRAs and, in a few cases, interviews with other stakeholders.

It is important to note that **the vast majority of the sandboxes studied have not yet been concluded**, with a portion having no live projects. As such, evidence on the impact of Dynamic Regulation is mostly limited to the design, implementation and process involved in Dynamic Regulation. Where available for advanced or completed projects, the consumer impacts of Dynamic Regulation initiatives are presented as well. It was also sought to provide geographical diversity in the case studies – covering each region of the EU and including examples from both smaller and larger MS.

Six case studies from within the EU were selected:

- **France.** The Regulatory Experimentation System (regulatory sandbox) was introduced into legislation in 2019 and allows the NRA (*CRE*) to grant exemptions to the conditions of access to and use of energy networks, and facilitates the experimental deployment of innovative technologies or services that could support the energy transition, smart grids and infrastructure.
- **Ireland.** The NRA (*CRU*) developed the Strategic Innovation Fund (SIF) following the publication of its Price Review 4 (2016-2020) decision. The SIF provides funding for research, development, demonstration and adoption of innovative technologies, as well as operating and commercial arrangements. The fund is designed to facilitate major change within the DSO organisation and network to meet the challenges and opportunities that the DSO will face as the Irish economy decarbonises – such as an increased share of renewable energy and the rollout of smart meters.
- **Italy.** The NRA (*ARERA*) has been using a number of Dynamic Regulation approaches as it seeks to establish a regulatory environment that supports innovation, with the need to support innovation being driven by the power system transformation to a decarbonised system. Recently, a number of pilot regulations have been launched using a temporary ex-ante regulatory framework, which allows market players to experiment with innovation with a relatively low burden for the NRA.<sup>25</sup> ARERA introduced 'regulatory experiments' for the tariff period 2020-2023. Under the experiment, a DSO may propose an alternative path to the standard trajectory for improving energy reliability in the parts of its network that have previously had the worst reliability.
- **Lithuania.** The National Energy Independence Strategy (2018) places emphasis on the role of innovation in energy policy, with an objective that Lithuania would become an exporter of energy technology. An amendment was made to the Energy Law to introduce the possibility of using a pilot environment (regulatory sandbox) to test energy innovations.

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<sup>25</sup> The Italian pilot regulations are described in detail in the ISGAN Casebooks. See: International Smart Grids Action Network (2021), Innovative Regulatory Approaches with Focus on Experimental Sandboxes 2.0 – Casebook, October. Accessed at: [https://www.iea-igsaw.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0\\_For-Publication.pdf](https://www.iea-igsaw.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf)

This enables innovators to carry out live testing of new products and business solutions, under the supervision of the NRA.

- **The Netherlands.** The *Experimenten Elektriciteitswet* (EE) was a temporary law that allowed the testing of community energy projects in a regulatory sandbox. The EE aimed to make it easier for decentralised energy projects to be developed – with a key feature being an exemption from the unbundling requirement on supply and distribution – and, in turn, this was meant to inform future legislative and regulatory changes. Exemptions under the EE were limited to two types of organisations: cooperatives and housing associations.
- **Portugal.** The NRA (ERSE) has enabled pilot projects to take place with regard to specific activities in the energy sector that are deemed clearly innovative and important for the decarbonisation of the Portuguese energy system. Since 2019, a more standardised framework for conducting pilot projects has been introduced, which so far has focused on smart grids, dynamic tariffs, consumer participation in the reserve market, self-consumption (energy communities) and electro mobility. The framework was extended in 2021 to cover gas networks, with the aim of testing hydrogen injections.

Additionally, two non-EU case studies are presented:<sup>26</sup>

- **Australia.** In 2018, the NRA (*AER*), Energy Networks Australia, and Energy Consumers Australia set out a new regulatory approach to be trialled ('New Reg'). The aim of the trial was to identify the need for changes to the rules that govern the AER's tariff-setting methodology and process. Lessons from the trial would then feed into rule-change proposals. The main principle of the process was the opportunity for a network operator to reach agreement with its consumers that its tariff proposal made to the AER, or elements of the proposal, reflects consumer preferences. This was done by introducing a counterparty, a Customer Forum that represented the interests of consumers and reflected this in their negotiations with the DSO on the revenue proposal.
- **Great Britain.** The NRA *Ofgem's* Innovation Link service includes a regulatory sandbox to help innovators trial and bring to market new products, services and business models that cannot currently operate under existing market regulations. These trials run for a set period of time, normally up to two years, with a limited number of customers. Initially provided through application windows, changes were made in 2020 to move to an on-demand service and expand the types of support on offer. The sandbox is available to all activities that interact with regulated energy markets.

## 1.5 The assessment of the regulatory sandboxes in incentive regulation

The countries listed above have implemented a variety of different types of Dynamic Regulation approaches. In this context, it is important to mention that the CEER Distribution Systems Working Group also looked at regulatory sandboxes in incentive regulation and developed a toolkit.<sup>27</sup>

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<sup>26</sup> As part of this study, no interviews were conducted for the Australian and British case studies. However, CEPA conducted a series of interviews relating to each of these case studies as part of past projects. The insights from those past interviews were reflected in the write-up of these case studies in this report.

<sup>27</sup> CEER Paper on Regulatory Sandboxes in Incentive Regulation, Ref: C21-DS-74-04, 25 May 2022



Regulatory sandboxes, as well as other tools that regulators use to foster and support innovation, are part of Dynamic Regulation, one of the pillars of CEER's 2019-2021 strategy and a key part of the second regulatory dimension of CEER's 2022-2025 strategy. Regulatory sandboxes are part of the NRA's toolkit to facilitate innovation without compromising the efficacy of incentives for efficient operation or the role of the DSO as a neutral market facilitator.

NRAs should engage at least in removing barriers to innovation, as a first preliminary step. Further recommendations are:

- NRAs could use the toolkit with four complementary tools (regulatory sandboxes, pilot projects, regulatory experiments and pilot regulations), selecting the best-suited tool, or combination of tools, according to specific cases;
- When approaching the toolkit, NRAs should care of different regulatory treatment between regulated grid activities and competitive market activities, including funding;
- When supporting innovation, NRAs must avoid the foreclosure of competition in wholesale, retail and adjacent markets; and
- Improving the learning process among all involved parts, regulators included, and dissemination of knowledge are ultimately the goals of each regulatory tool for supporting innovation.

## 1.6 Other experience with innovations from stakeholders

The case studies presented in this report are part of a broader landscape of initiatives to support and further innovation in the energy sector that NRAs are thoroughly looking at.

For example, the European Networks of Transmission System Operators in electricity and gas (ENTSO-E and ENTSOG, respectively) carry out a number of initiatives. Both ENTSO-E and ENTSOG are proactive in promoting innovation within their respective sectors. They take roughly similar approaches, while reflecting sector-specific characteristics.

This common approach is:

- Setting out a long-term strategic vision for innovation and its role in the decarbonisation of the respective sectors. For ENTSO-E, this is captured in a Research, Development and Innovation Roadmap that takes a 10-year forward horizon.<sup>28</sup> For ENTSOG, this was most recently captured in a 2050 Roadmap.
- Identifying the short-term initiatives that are required to enable the strategic vision. ENTSO-E publishes Research and Innovation Implementation Plans – the most recent of which (2017-2019)<sup>29</sup> identified 23 topics for action under the thematic umbrella used in the 2017-26 Roadmap. ENTSOG published an Action Plan<sup>30</sup> to complement its 2050 Roadmap,

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<sup>28</sup> ENTSO-E, Research, Development & Innovation Roadmap 2020–2030, available at: [https://eepublicdownloads.entsoe.eu/clean-documents/Publications/RDC%20publications/entso-e-ridi\\_roadmap-2020-2030.pdf](https://eepublicdownloads.entsoe.eu/clean-documents/Publications/RDC%20publications/entso-e-ridi_roadmap-2020-2030.pdf)

<sup>29</sup> ENTSO-E, R&I Implementation Plan 2017 – 2019, available at: [https://eepublicdownloads.entsoe.eu/clean-documents/Publications/RDC%20publications/entso-e\\_RI\\_IP\\_2017\\_2019\\_web.pdf](https://eepublicdownloads.entsoe.eu/clean-documents/Publications/RDC%20publications/entso-e_RI_IP_2017_2019_web.pdf)

<sup>30</sup> ENTSOG, 2050 Roadmap Action Plan, available at: [https://entsog.eu/sites/default/files/2020-10/entsog\\_Roadmap\\_2050\\_Action\\_Plan\\_201012.pdf](https://entsog.eu/sites/default/files/2020-10/entsog_Roadmap_2050_Action_Plan_201012.pdf)

with actions grouped under the seven recommendations themes from the Roadmap.<sup>31</sup> Both organisations monitor the progress of innovation activities against these plans.<sup>32</sup>

- Creating a platform (ENTSO-E Initiative) for highlighting innovation projects and sharing insights. ENTSO-E's web site includes a page dedicated to research and innovation and the ENTSO-E research and innovation web page highlights pan-European innovation projects that are funded under the EU Commission's Horizon 2020 projects, and in which ENTSO-E itself is a partner.

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<sup>31</sup> ENTSG, 2050 Roadmap for Gas Grids, available at: <https://entsog.eu/sites/default/files/2019-12/ENTSG%20Roadmap%202050%20for%20Gas%20Grids.pdf>

<sup>32</sup> E.g. ENTSO-E, Monitoring Report 2018 Research, Development and Innovation Projects, available at: [https://rdmonitoring.entsoe.eu/wp-content/uploads/2019/05/entso-e\\_RDnI\\_MR\\_2019\\_Main\\_Report\\_190510.pdf](https://rdmonitoring.entsoe.eu/wp-content/uploads/2019/05/entso-e_RDnI_MR_2019_Main_Report_190510.pdf)

## 2 Summary of the case studies

This section summarises the insights from the case studies and discusses **why and how** Dynamic Regulation has been introduced, followed by the **impact** of Dynamic Regulation. Detailed descriptions of the case studies can be found in the appendix to this report.

### 2.1 The aims towards which Dynamic Regulation has been used

Several aims of Dynamic Regulation are common across the cases examined. These common aims usually reflect the statutory duties that apply to NRAs, specifically the promotion of consumers' interest, enabling the decarbonisation of the energy system, and enabling innovation (including in the form of competition / market entry). These common aims are also interconnected – innovation is sought to support the energy transition in a way that benefits consumers.



The **Irish** case study is an example where Dynamic Regulation has been used for decarbonisation. The SIF was designed by the CRU to facilitate major change within the DSO organisation and network to meet the challenges and opportunities that the DSO will face as the Irish economy decarbonises.

Similarly, in **Italy**, ARERA has been using a number of Dynamic Regulation approaches to support innovation being driven by the transformation to a decarbonised system. Previously focused on electricity, ARERA's strategy for 2022-2025 has committed to extending the use of Dynamic Regulation to green gas.

The aim of Dynamic Regulation to deliver consumer benefits independently of the energy transition is also a common theme. In the **Australian** case, the overall vision of the New Reg trial was that energy consumers' priorities should influence the tariff proposals made by the energy network operators to the AER. New Reg introduced a counterparty with which the DSO had to negotiate elements of its tariff proposal. This made consumers' preferences central to the New Reg process.

In the **British** sandbox, Ofgem looked to approve applications that had "desirable innovation features" and one example given was inclusivity. This referred to innovations that allow different types of consumers (including those in vulnerable situations) to participate in and benefit from a smart, flexible energy system. The pilot projects framework in **Portugal** is also targeted towards activities that ERSE deems to be clearly innovative.

Other case studies had specific aims driven by local contexts. These include:

- **Visibility of innovations** – the French sandbox was intended as a way of formalising the regulatory structure around experimentations that involved network access or use.
- **Enable market entry** – Dynamic Regulation can help bring innovations to the market. For example, the French and British NRAs offer support to applicants to identify regulatory barriers that would require derogations. Similarly, the Dutch sandbox aimed to make it easier for decentralised energy projects to be developed, to enable a more efficient use of the available energy infrastructure and facilitate greater involvement of electricity users in their energy supply.
- **Achieve a specific system outcome** – in the Italian case, ARERA sought to address deteriorating network reliability, which had been observed during the 2016-2019 period, after 15 years of continuous improvements in reliability.

## 2.2 The activities to which Dynamic Regulation has been applied

When setting out who can use the tools on offer in Dynamic Regulation, there are two different approaches: those that are aimed at network operators, and those that are open to a broader range of market participants. Examples of approaches that focus on **network operators** include:

- **Ireland** – the SIF was only made available to the DSO. A strength of this approach was that the aims of the mechanism were specific to the DSO, and the funding provided and CRU's feedback were targeted towards those aims. A disadvantage of this approach is that it potentially limited third-party involvement in innovation.
- **Italy** – the regulatory experiment created by ARERA was only available to the DSOs, and only in areas that were identified as 'critical' from a reliability perspective. A strength of this approach is that it is targeted at the areas of the network that would benefit the most from improved reliability. A limitation of this approach is that it was limited to the DSO's role – alternative innovative solutions that may be able to achieve the right balance of reliability and cost for consumers were not incentivised under this specific experiment. ARERA has adopted other Dynamic Regulation approaches when the objective was to seek innovative solutions from market participants more broadly.
- **Australia** – the New Reg trial was only open to network operators, as it only related to the revenue-setting process.

Elsewhere Dynamic Regulation has been applied more broadly to **energy market participants**:

The **British** sandbox is open to all energy activities. Applications can be led by an energy licensee or by innovators who themselves are not licensed but partner with a licensee. A strength of this approach is that there is scope for the market to propose innovations, rather than relying on the NRA to identify promising innovations. However, the innovator-led approach means that there is limited strategic direction or coordination of sandboxes, which means that there is less opportunity to gain systematic insights that could inform future regulatory policy.

The approaches taken in **France, Lithuania the Netherlands and Portugal** are also open to a wider range of market participants. Each country has interpreted the concept of a regulatory

sandbox differently – reflecting local context – and this is notable in the role that network operators play in each country's sandbox:

- The **French** sandbox is limited to experiments in the access and use of the networks. So, network operators can be consulted on sandbox applications that the CRE deems eligible. This reflects the fact that a network operator would often need to be involved in an experiment that is granted under the sandbox.
- In the **Lithuanian** case, the sandbox is available for activities in electricity, gas and district heating and can be accessed by either regulated or unregulated companies. However, VERT expects that the need for exemption is likely to be more valuable for regulated companies.
- In the **Dutch** case, there were two types of projects eligible for an exemption: 'Large Experiments' involved an energy community and a local DSO, whereas in 'Project Network' the energy community took on the role of the network operator behind the connection with only one connection to the local DSO.
- In **Portugal**, each pilot project has involved different lead proponents (e.g. suppliers, energy communities, the TSO). This reflected the types of activities involved in each pilot.

#### Great Britain

Examples of sandboxes granted include: peer-to-peer electricity trading platforms, a new price-discovery methodology for facilitating investment in on-street EV charge point infrastructure, and a new industry methodology to facilitate the supplier switching process on microgrids.

#### Italy

The regulatory experiment relates to reliability of the distribution network. Exemptions requested so far have focused on using a less stringent measure of MAIFI – calculated for short interruptions lasting more than 5 seconds (instead of 1 second in the standard incentive) and yearly targets on a less stringent path than under the standard incentive.

#### Australia

The New Reg trial related to the 5-yearly revenue setting process by the Australian Energy Regulator. Negotiations between the network operator AusNet Services and the Customer Forum included: operating, augmentation and replacement expenditures; innovation and smart metering; and customer experience and customer hardship arrangements.

#### Portugal

Pilot projects have largely been enabled for electricity activities such as smart grids, dynamic tariffs, consumer participation in the reserve market, self-consumption and electromobility. In 2021 the possibility of running pilot projects was expected to cover gas networks.

#### France

Derogations granted in the first sandbox window include: participation of storage in the provision of system services, network tariffs to develop local flexibilities, and injection of synthetic methane into the gas networks.

#### Ireland

Projects trialled peer-to-peer energy trading and digital platform strategies, such as apps to support all technical trials; deployment and implementation of technologies such as solar PV systems, battery management systems, air source heat pumps, energy monitoring systems, electric vehicles and smart electric vehicle chargers.

#### Netherlands

Examples of energy community initiatives granted under the sandbox include the Schoonschip project, which consists of a private electricity grid with 30 connections. Each boat-home in the project is equipped with a battery, smart heat pumps, heat storage tank and smart appliances. Smart grid software is used to manage households' flexible assets.

*Figure 1: Examples of activities to which Dynamic Regulation has been applied*  
Source: CEPA review of case studies

Note: MAIFI is the Momentary Average Interruption Frequency Index

## 2.3 Legal framework for Dynamic Regulation

The cases reviewed can be assigned to three types of enabling environments for Dynamic Regulation: flexibility within the legal framework that applies to market participants and implemented by the NRA; flexibility within NRA's tariff-setting processes that apply to network companies; and introduction of specific legislation.

The wide range of Dynamic Regulation approaches used in **Italy** reflects the freedoms available to ARERA under the ordinary legal powers deriving from domestic law. The law sets out in broad terms ARERA's responsibilities such as with regard to licensing energy activities, setting tariffs, monitoring market participants' conduct and performance. In the specific example of the regulatory experiment reviewed, ARERA granted derogations as part of the tariff-setting process for DSOs.

Likewise, in **Portugal**, the introduction of pilot projects was possible within ERSE's general regulatory discretion to amend the regulations that apply to electricity, gas, electromobility, and fuel and liquefied petroleum gas.

**Australia's** legal framework had enough flexibility to conduct the New Reg trial within the existing National Electricity Law and National Electricity Rules. But while there was flexibility to undertake the trial, the same legal framework constrained some of AER's decision making, as the AER was not able to enact some positions agreed between the network operator and the Customer Forum where these fell outside the standard revenue-setting framework that governs the AER's decisions. The New Reg Trial has highlighted some of the restrictions that exist within the current legal framework regarding tariff setting. This has strengthened the impetus for reforming some of rules that govern the tariff-setting process.

The **British** sandbox is an example of an enabling framework evolving over time. The latest approach to the sandbox can change rules controlled by Ofgem (usually in licences), or in some cases from the rulebooks owned by the industry, which involve day-to-day operations of the system. The need to involve Code Administrators was identified following the first sandbox window; initially derogations were limited to the rules for which Ofgem had direct responsibility.

In the **Irish** case, the SIF was within scope of the CRU duties and no changes were needed to the DSO's licence, as the existing licence conditions are broad. CRU was also able to provide the funding for the SIF as part of the standard revenue-setting process. The Dingle Project – a major initiative funded via the SIF – involved activities that the CRU characterises as being “outside the norm” for the DSO. However, these activities were treated as a pilot, meaning they did not require a licence change.

In some country contexts, there was a need to introduce specific legislation to enable Dynamic Regulation, and create the framework for derogations to be granted for energy innovations:

- **France** – the Energy-Climate Law, which came into effect in 2019, introduced a regulatory sandbox in the energy sector. The Law states that experiments conducted under the

sandbox must contribute to the achievement of the energy policy objectives defined in the Energy Code.<sup>33</sup>

- **Lithuania** – the Energy Law (2020) included 11 Acts related to supporting innovation, of which the sandbox was one. The amendments to the Energy Law establish the main principles and criteria for such regulatory sandbox and the rights and obligations of participants in this regulatory approach.
- **Netherlands** – Article 7a of the Electricity Act 1998 was introduced in 2015 and made it possible to deviate from the provisions of that Act for the purpose of experiments that contribute to “developments in the field of production, transport and delivery of locally generated sustainable electricity, or electricity generated in an installation for cogeneration”.

Another key difference in the enabling framework for Dynamic Regulation is the length of time for which the exemption or trial are granted. The timeframes that apply to experiments and trials varied in different cases, as highlighted in Figure 2.



Figure 2: Timeframes that apply to experiments in the case studies

Source: CEPA review of case studies

<sup>33</sup> The energy policy objectives are: enabling the rise of a competitive economy and the development of employment; enabling security of supply and the reduction of the reliance on imports; enabling a competitive and attractive price for energy; enabling the protection of human health and of the environment; participating in the social and territorial cohesion; participating in the fight against energy insecurity; and contributing to the rise of the 'European Energy Union'.

## 2.4 The roles of the NRAs in Dynamic Regulation

Some NRAs were driving the process, while others acted as a facilitator of Dynamic Regulation.<sup>34</sup> In the Dutch case, the NRA had more limited involvement in the process. All NRAs, except in the Netherlands case, were involved in monitoring and evaluating reports provided from experiment participants.

### Driving the process

**Italy** – ARERA sets out the pilots or experiments to which market actors and/or network operators respond. In the case of the regulatory experiment, ARERA set out the criteria for the experiment being permissible and is responsible for assessing DSOs' requests for exemption from the standard regulation to participate in the experiment.

**Ireland** – the CRU established the SIF and determined the total amount of funding available. During the regulatory period (2016-2020), CRU monitored and evaluated how the DSO used the money granted under the SIF by assessing an annual report by the DSO.

**Portugal** – ERSE both drives the process initially and then acts as a facilitator. First, ERSE would amend a regulation to make pilot projects permissible with regard to a certain activity (e.g. electromobility); second, ERSE would approve applications for individual pilot projects relating to that activity, on a case-by-case basis.

### Facilitator

**Australia** – the AER acted as a facilitator of the New Reg trial. The scope of negotiation is defined by agreement between the network operator, the Customer Forum and the AER. The AER also provides technical and economic support to the Customer Forum during the negotiations. After the negotiations conclude and the network operator's proposal was submitted, the AER undertook its formal assessment of the proposal in line with the standard price review.

**Great Britain, France and Lithuania** – all three NRAs assess applications against set out eligibility criteria, where the innovators bring forward their own ideas. The NRAs in Britain and France (Ofgem and CRE, respectively) offer support to applicants to identify regulatory barriers that would require a derogation. This is set out in four tools used in the British sandbox: provision of bespoke guidance, provision of comfort, confirmation that a particular activity is permissible and derogations. In the French case, the NRA initiates invitations for sandbox applications and engages with prospective applicants to help them identify the regulatory barriers, before assessing the application. Both Ofgem and the CRE work with other authorities when approving sandboxes. In France, this collaboration is formalised – the Ministry of Energy is the competent authority for granting some of the derogations for the sandbox, either alone or jointly with CRE. The Ministry also receives sandbox applications directly. In Britain, collaboration between Ofgem and the Code Administrators is on a case-by-case basis, depending on whether a derogation request relates to industry codes.

<sup>34</sup> The introduction of Dynamic Regulation in all cases did not create new oversight of the NRA. The NRAs have existing duties and existing supervisor bodies that they report to and this continues to be the case for Dynamic Regulation.



#### Facilitator

**Great Britain** – Ofgem has moved to an on-demand service for its sandbox, having previously ran two application windows, whereas CRE is currently using application windows. Using application windows could enable better streamlining of the timeline of the sandbox with the regulatory process. For example, the timing of the results of the sandbox can be set to feed directly into a revision of the regulatory framework. Many applications received in the first window were submitted at or near the deadline, as well as generally a high volume of applicants, and this put an administrative burden on CRE. This is a potential limitation of using application windows and it is likely that Ofgem's on-demand service reduces this risk.

**There is the additional strength to the on-demand approach that windows and deadlines may result in missed opportunities for innovators to apply when they really need the service.**

#### Limited involvement

**Netherlands** – the ACM had a relatively limited role in the sandbox. Its primary function was to approve the tariff methodologies proposed by project developers once the project had received an exemption to operate within the sandbox. RVO was responsible for stakeholder communications, reviewing applications, and monitoring the progress of projects that received exemptions. The ACM could only review the tariff methodology after the RVO had granted an exemption of the project – restricting what ACM could do in such situations if a tariff methodology was deemed unsuitable.

## 2.5 How are Dynamic Regulation projects funded?

There were also differences between cases on the funding and incentives provided by the NRA to participate in experiments or trials. The following four categories were identified:

- **No funding provided** – e.g. British, French, Dutch sandboxes and Portuguese pilot projects. While this approach intends to preserve competition in energy markets, one downside is that a lack of funding as part of the Dynamic Regulation initiative itself can make it difficult to establish viable business cases for innovative projects – a point raised by interviewees from the Netherlands. Where no funding is provided as part of the Dynamic Regulation itself, innovators may be able to access funding from national and European sources – such as the EU's Horizon 2020 programme.
- **Funding provided** – Ireland, the SIF was set at €100m in total, split evenly at €20m for each year. The CRU would assess DSO reports on an annual basis and decide if any money is withheld. The CRU's approach is further explained in the footnote<sup>35</sup>.

<sup>35</sup> The value of the SIF for Price Review 4 was set at €100m; €20m for each year of the regulatory period (2016-2020). Funding under the SIF was provided by the CRU on an ex-ante basis, and was subject to an annual assessment by the CRU, which could result in some of the funding being clawed back via the next year's network tariffs. The CRU's assessed: the quality of the process to identify innovation; the efficiency in delivery of innovative projects; and the way that project learnings or outcomes have been used by the DSO. The assessment was based on an annual submission by the DSO, consistent with CRU guidance. The evidence presented in each

- **Rewards and risk of penalties** – Italy's DSO quality of service incentive. DSOs can propose an alternative path for improving reliability indicators over the regulatory period,<sup>36</sup> as long as the previous year's target is no worse than would have been under the standard incentive. During the regulatory period, no rewards or bonuses are applied relative to the alternative path. Performance against the target is only assessed in the final year of the regulatory period. Failure to meet the target results in the same penalty as would have been applied under the standard incentive. Outperformance of the target results in a reward up to the level that would have been achieved under the standard incentive.
- **Other incentives** – Lithuania's sandbox process establishes upfront the success criteria for each trial and the implications of success once a trial is complete. For example, for successful projects by the DSO or TSO, the investment would be eligible for a 1% premium on the rate of return, for a period of five years.

Where funding has been provided, it has been recovered through network operators' regulated tariffs. Since these funds ultimately come from energy consumers, NRAs that provided funding for Dynamic Regulation have included back-stops that recover (a share of) the funding if the network operator has not met the targets of the initiative. Funding is also temporary and only provided while the trial is operating.

## 2.6 The role of stakeholders in Dynamic Regulation

The case studies examined had varying roles of stakeholder involvement in the Dynamic Regulation. These roles have been split into the four following categories:

- **Stakeholders directly involved** – in Australia, the New Reg process involved a counter party, the Customer Forum that was directly involved in negotiations with the network operator on aspects of the network operator's revenue proposal.
- **Collaboration**<sup>37</sup> – the Dutch and French cases involved other organisations in the Dynamic Regulation. In the Netherlands, the sandbox was administered by RVO, with approval for tariff methodologies being sought from the NRA. The French NRA worked in collaboration with the Ministry of Energy, the competent authority for granting some of the derogations sought under the sandbox, as well as consulting with network operators.
- **Advisory role** – in Italy, ARERA develops its Dynamic Regulation approaches through extensive stakeholder engagement and through relationships with universities and research institutes. A similar approach is taken in Portugal by ERSE to identify the activities for which pilot projects should be permissible.

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year was consolidated by the CRU into an overall assessment of "strong", "adequate" or "weak". An adequate score resulted in €5m being clawed back, and a "weak" score resulted in €15m being clawed back. A strength of providing funding with a risk of money being withheld is that this increased accountability, incentives and ensures attention is paid to innovation at senior levels within the DSO.

<sup>36</sup> The incentive uses the following reliability indicators: System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Momentary Average Interruption Frequency Index (MAIFI).

<sup>37</sup> In the process of assessing sandbox applications in Lithuania, VERT may engage with other state and/or municipal institutions, enterprises, bodies and organisations, and exchange information as necessary to inform its decision. Lithuania is at an early stages of applying the sandbox, so the precise role of stakeholders is yet to be fully determined.

- Limited stakeholder engagement** – in Ireland, the SIF was only made available to the DSO and did not involve a formal role for third parties. However, the DSO set up an Innovation Stakeholder Panel in 2020 – towards the end of the regulatory period in which the SIF applied.



Figure 3: Overview of how Dynamic Regulation case studies are enabled  
Source: CEPA review of case studies

## 2.7 The impact of Dynamic Regulation

The cases of Dynamic Regulation examined varied in the stage of their development and this is highlighted in Figure 4. It is important to note that some of the cases currently do not have live trials. For example, there are currently no active projects under the French sandbox. In the first application window, 42 applications were received by CRE, of which CRE deemed 20 to be eligible. In March 2021, CRE granted derogations to nine projects out of 10 projects for which it was the competent authority.

The Lithuanian sandbox regulation is very recent and, at the time of this report, there have been no formal applications for the sandbox. The rest of this section focuses on the available results for Australia, Britain, Ireland, Italy and the Netherlands.

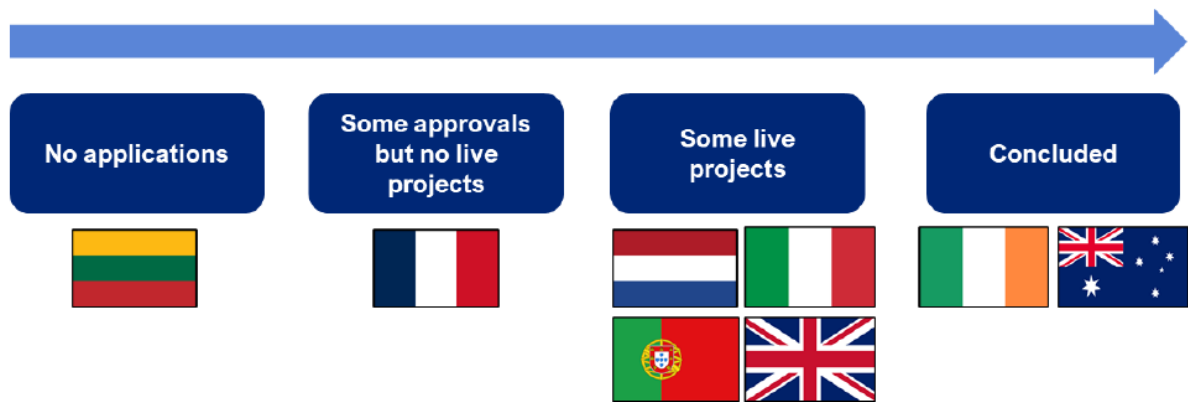


Figure 4: Development stage of case studies examined

Source: CEPA review of case studies

- **Australia** – The New Reg trial has only been trialled with one DSO (AusNet Services). So far, there are no plans to run more trials of New Reg, although some of the concepts first introduced in the New Reg trial have now been adopted by the AER for its revenue-setting processes.
- **Britain** – In the first two sandbox windows in 2017, there were 67 applications, seven sandboxes granted and three proceeded to trial. A further three applications have been granted sandbox since 2020. As a result of the first sandbox application window, Ofgem identified a number of lessons and has reformed its approach accordingly. For example, Ofgem introduced the 'Fast, Frank Feedback' service to provide innovators with advice without requiring a sandbox application. The help that is offered to innovators includes: advice to better understand their own innovations and how they can work within the market; the provision of guidance regarding upcoming regulation; and help to ensure that innovation is focused on improving customer impacts.
- **Ireland** – The CRU considers the SIF to have been effective in enabling the organisational capability, structures and governance of innovation within the DSO in Price Review 4. For Price Review 5 (2021-2025) the CRU has replaced SIF with an Innovation and R&D mechanism, as well as is looking to embed innovation more broadly within the regulatory settlement by increasing the focus on the outcomes delivered by the DSO. The DSO estimates that, during 2016 – 2020, €60m was saved from a programme of 83 innovation projects.
- **Italy** – In the 2020-2023 regulatory period, the regulatory experiment has been taken up by two DSOs. The experiment covers approximately a quarter of total network users (9.6 million out of 37 million) in 63 out of 330 areas.
- **Portugal** – Different pilot projects are at different stages. The main pilot project that has been completed and reported on to date relates to consumer participation in the regulatory reserve market. 28 applications to participate in the pilot were made, with 20 of these proceeding to preliminary testing, and six applicants ultimately being authorised to start operation in 2019, with four more becoming authorised in 2020.
- **The Netherlands** – The sandbox was in place for four years and the RVO received 20 applications. RVO rejected three and a further three were withdrawn. At present, five of the projects that were granted an exemption are operational. After the expiry of the temporary law, the Ministry of Economic Affairs and Climate Policy developed new legislation that was intended to make exemptions available to all market players (e.g. suppliers, network

operators, aggregators) in gas, as well as in electricity. However, this proposal has been withdrawn.

Legal constraints can often be a challenge for Dynamic Regulation and the process can identify needs for legal reform and create a **feedback loop**. Case examples include:

- **Britain** – In light of lessons from the first sandbox windows, it was recognised that innovators often needed relief from industry codes. In response, Elexon (for the Balancing and Settlement Code) and ElectraLink (for the Distribution Connection and Use of System Agreement) have introduced sandbox derogation tools for electricity licence holders and some non-licensed electricity parties. This response increases the scope and range of tools that innovators can access by applying to the sandbox. However, similar provisions have not yet been developed for gas codes. Ofgem is looking to extend the number of rules in the supply licence that can be derogated from.
- **Australia** – The New Reg trial was conducted within the framework of the existing National Electricity Law and National Electricity Rules. However, an aim of the project was that the experience of the trial would inform the need for potential future change proposals to the Rules. The trial revealed a number of limitations of the Rules that govern the price reviews – such as a ‘blind spot’ in relation to service standards and other outcomes that customers would like their network business to deliver. In addition, based on its interpretation of the Rules, the AER was not able to adopt the revenue path agreed in the negotiations between AusNet Services and the Customer Forum. The AER may have formed a different view on whether the negotiated revenue path was in the long-term interest of consumers, had the Rules provided it with the freedom to do so. The insights gained from the trial have been used by the AER to revise its guidebook for price reviews, and can be used to inform changes to the rules.
- **Netherlands** – There has been ongoing legislative reform since the law enabling sandboxes expired. A draft Energy Law is currently being consulted on. Amongst other things, the law would introduce an automatic exemption for small suppliers (less than 500 customers) – reflecting the lessons gained from the sandbox process. Another impact has been the potential to reform network tariffs in light of lessons from the sandbox trials. Currently, two DSO-led working groups are exploring a tariff reform. In addition, the *Voortgang Energietransitie* (Progressing the Energy Transition Law) was introduced in 2018 and allows for more experiments by network operators. For example, ACM has granted exemptions such as for the development of a direct current network by the DSO Liander. This exemption was granted with the expectation that insights from this project, which has a five-year timeframe followed by a four-year evaluation period – would inform the need for more fundamental legislative changes to facilitated direct current networks.

It has been more difficult to establish a direct link between the lessons from the Dynamic Regulation case studies and NRAs’ overall approach towards regulating in a more flexible manner. However, the simple fact that an NRA has introduced or taken on a Dynamic Regulation initiative demonstrates institutional willingness to find ways for the NRA to better support innovation.

## 2.8 The impact of Dynamic Regulation on consumers

From the case studies reviewed, the following three impacts of Dynamic Regulation on consumers have been identified:

- **Consumer preferences become more central in decision making** – in setting Dynamic Regulation, NRAs often stress the need for innovators or participants to focus on the consumer impacts of their innovation. For example, the need for consumer benefit is part of the British, French and Lithuanian sandbox eligibility criteria. In **Ireland**, the CRU considers that the DSO is now more clearly focused on consumer benefits in its approach to innovation. In CEPA's evaluation of **Britain's** sandbox, one benefit attributed by those organisations to the sandbox was that engagement with Ofgem's Innovation Link in setting up the trial helped ensure that the trial put customers first. This, in turn, helped focus the innovator's proposition and led to a more customer-oriented trial design.
- **Improved network management** – The Dingle Project was a cluster of innovation pilots in a remote part of southwest **Ireland**. As a result of these pilots, the DSO has an increased visibility of the medium voltage (MV) Network, contributing to increased reliability in that part of the system. There is also increased remote control and automation of the MV network devices. This allows for reduced Customer Interruptions and reduced Customer Minutes Lost. In **Italy**, it is too early to determine how successful the experiment has been in achieving better improvements in reliability than would otherwise be the case. However, evidence from the first year of the experiment – 2020 – shows improvement in the reliability indicators for nearly all areas in which the experiment applies.
- **Increased consumer confidence in regulation** – In the evaluation of the New Reg trial in **Australia**, the negotiation process has generally helped to enhance consumer confidence in the regulatory review.<sup>38</sup> Stakeholder submissions demonstrated confidence that many of the positions agreed by AusNet Services and the Customer Forum were in the long-term interest of consumers. However, there were some concerns raised in relation to the level of engagement with major commercial and industrial customers, vulnerable customers and culturally diverse customers.<sup>39</sup> The sandbox in the **Netherlands** increased consumer confidence that they themselves can undertake energy projects.

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<sup>38</sup> CEPA (2021), New Reg: AusNet Services Trial, Final Evaluation Report, Australian Energy Regulator, June. Available at: [https://www.ofgem.gov.uk/sites/default/files/docs/2021/05/cepareport\\_ofgem\\_evaluationof\\_innovationlink\\_final.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2021/05/cepareport_ofgem_evaluationof_innovationlink_final.pdf)

<sup>39</sup> Representatives of major customers and vulnerable customers are typically some of the most active stakeholders in the standard tariff-setting process in Australia, but played a less central role than the Consumer Forum in the New Reg trial.

### 3 Recommendations for NRAs to better implement Dynamic Regulation

This section identifies recommendations for the best practice use of Dynamic Regulation. These recommendations are based on the analysis of the case studies. There is no single approach to Dynamic Regulation that would be best suited to all circumstances since the energy systems of countries, and their current regulations, represent different starting points. Therefore, the recommendations are grouped as follows:

- The **first set** of recommendations relate to the **common features** that all Dynamic Regulation initiative must have in order to be successful in forming the foundations of effective public policy
- The **second set** of recommendations highlight the **options available** to tailor Dynamic Regulation to the circumstances at hand.

There are interactions and dependencies between the different elements of Dynamic Regulation that have been covered in this section. Nevertheless, the recommendations are presented in a sequence that would represent a logical workflow or “playbook” for implementing a Dynamic Regulation initiative.

#### 3.1 Common enablers of successful Dynamic Regulation Initiatives

To develop a successful Dynamic Regulation approach it is necessary to consider the following enablers.

##### 3.1.1 Clarity on the objectives of the Dynamic Regulation initiative

The first step in developing successful Dynamic Regulation approaches is to **clearly identify the aims that are being sought**. Dynamic Regulation can be used for a wide variety of objectives, ranging from the very broad to the very narrow. The Lithuanian sandbox is an example of the former – it has broad objectives related to the promotion of energy innovation. The Italian regulatory experiment that was reviewed is an example of the latter – it is focused on improving reliability of supply in the worst performing areas of the network.<sup>40</sup>

There is no *a priori* reason to expect that having a broad or a narrow objective is preferable. What does matter is having clarity on the objectives sought and communicating those clearly to all stakeholders. Clarity is required to ensure that actions by the NRA, energy sector participants, and other stakeholders are all guided towards a shared outcome.

In some cases, there will be a clear need or deficiency that inform the objective of a Dynamic Regulation initiative. In other cases, objectives could be identified and prioritised based on a

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<sup>40</sup> Italy is a country that has implemented different types of Dynamic Regulation initiatives. Our comments above reflect only the regulatory experiment that was reviewed as a case study. Other Dynamic Regulation initiatives would be characterised differently to the summary provided in this report.

consultative process. Pan-European initiatives can guide some of these decisions – although local factors must always be taken into account<sup>41</sup>.

### 3.1.2 Enabling framework and allocation of roles

Any Dynamic Regulation initiative must of course be **permissible under the relevant legislation and energy regulations**, but this can take different forms. This could be in the form of broad discretions available to the NRA under the existing regulations (as in the examples from Italy and Britain) or falling under the scope of how the NRA applies its regulations (as in the example of the Irish SIF). Where neither of these is available, specific changes may be needed to enable the use of Dynamic Regulation (as in the case of the Dutch, French and Lithuanian sandboxes). The appropriate framework and allocation of responsibilities will depend on the existing framework and competencies in each MS, as well as the aims of the Dynamic Regulation initiative.

As part of the enabling framework, there needs to be **clarity on the roles and responsibilities of all involved actors – and particularly the role of the NRA**. As shown above, NRAs have played a variety of roles in Dynamic Regulation in different countries. The role the NRA can play in Dynamic Regulation will depend on the scope of activities for which the NRA is the competent authority, as well as the level of discretion/autonomy the NRA has under national legislation.

Where a single entity (e.g. the NRA) plays the central role in enabling the Dynamic Regulation – as in the case of the Irish, Italian and Lithuanian case studies – the main advantages observed are: clarity on responsibilities and on who has the decision-making power; clarity on who innovators need to approach; ability to pursue a specific objective or agenda; and clear accountability. In contrast, the main advantage of Dynamic Regulation approaches that involve multiple entities playing a central role – as in the British, Dutch and French case studies – is that they foster co-operation. Such co-operation is likely to be essential for delivering the decarbonisation of the energy sector effectively. Co-operation will likely need to extend beyond energy governing bodies into related sectors such as telecommunications (for smart metering and internet-of-things offerings) and transport (for electric and hydrogen vehicles).

### 3.1.3 Approval process and criteria definition

A related element to the enabling framework is *how* Dynamic Regulation is implemented. In most of the cases, the NRA<sup>42</sup> granted a derogation or exemption to facilitate the trials/experiments under Dynamic Regulation. The **French** and **British** sandboxes represent examples where multiple organisations may be required to make derogations in order for the trial/experiment be permissible. These are examples of **case-by-case regulatory approval**. In other cases, such as the Irish SIF, Dynamic Regulation was enabled as a part of the NRA's standard tariff-setting process so there was no need for a specific derogation.

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<sup>41</sup> For example, ENTSO-E produces a roadmap that sets out the priority areas for innovation for TSOs. The 2020-30 roadmap identified the following priority areas: Cross-sector integration and deep electrification; Enhanced grid use, including reduced CO2 footprint of supply; Enhanced system operations, including offshore RES integration; and Cyber physical system.

<sup>42</sup> Or, in the Dutch and French cases, another organisation.



In **Italy**, ‘pilot regulations’ have been introduced in which the NRA specifies an upfront (ex-ante) detailed set of aims and criteria, which form the boundaries for experimentation that happens in parallel to the standard regulation, thus avoiding the need to grant case-by-case derogations.<sup>43</sup>

The process for being able to participate in the Dynamic Regulation initiative (including whether there is case-by-case or upfront approval) and eligibility criteria should be clearly set out and publicised, to reduce the time and resources spent on non-viable proposals. A key eligibility criterion in the case studies is that applicants need to specify which regulations currently act as a barrier to their proposed innovation. This requirement has an added benefit of helping to identify innovations that are perceived to face a barrier but are, in fact, permissible under the existing regulations. The appropriate criteria and processes will depend on the nature and aims of each Dynamic Regulation initiative. Table 3 summarises/compares the eligibility criteria used in the **British, French and Lithuanian** sandboxes, with less-common criteria in blue.




		
Projects must be <b>innovative</b>	Projects must be <b>innovative</b>	Projects must be <b>innovative</b>
Projects present <b>consumer benefit</b>	Projects present <b>consumer benefit</b>	Projects present <b>consumer benefit</b>
There is a clear regulatory barrier	There is a clear regulatory barrier	The project tests energy innovation in a <b>real environment</b>
The innovation is <b>ready</b> to be tested	Projects must contribute to the <b>energy policy objectives</b> defined in article L. 100-1 of the energy code	The innovation is <b>ready</b> to be tested
The innovation has an <b>exit strategy</b> (end, continuation with risk or code modification)	Projects represent a potential for <b>subsequent deployment</b>	The innovation has an <b>exit strategy</b> (end or extension)
<b>Supportability</b> - the sandbox can deliver what the innovator needs		<b>Applicability</b> – innovation is implemented in Lithuania and is relevant to the energy sectors regulated by VERT

Table 2: Summary of eligibility criteria used in the British, French and Lithuanian sandboxes projects  
Source: CEPA interpretation of qualification criteria for the relevant sandboxes

<sup>43</sup> Pilot regulations have been used, for example, to facilitate the participation of distributed energy resources in the provision of ancillary services to the TSO. See: International Smart Grids Action Network (2021), Innovative Regulatory Approaches with Focus on Experimental Sandboxes 2.0 – Casebook, October. Accessed at: [https://www.iea-igsaw.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0\\_For-Publication.pdf](https://www.iea-igsaw.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf)

### 3.1.4 Consumer protection

Innovation necessarily involves a higher degree of risk and likelihood of “failure” than regulators would typically be comfortable with. Depending on the innovation, such failures could include: higher-than-expected costs, technological and/or contractual lock-in that limit consumer choice, deterioration in reliability of supply, worse safety of energy services, etc. NRAs must ensure that any Dynamic Regulation initiative includes **appropriate consumer protections that are specifically tailored to the risks posed**. Such protections may need to include – depending on the innovation – protections of the wider consumer base, such as ensuring that participation on the Dynamic Regulation does not distort competition in energy markets.

In essence, NRAs would need to weigh the costs and benefits of different protections. It is likely that some protections could be specified upfront, whereas others may require the NRA to retain powers to “step-in” or ensure that any consumer harm is redressed swiftly and in full.

### 3.1.5 Communication and stakeholder support

Applicants to a Dynamic Regulation initiative are likely to require help:

- With being fully informed that the Dynamic Regulation initiative is available, its scope and objectives, the application process (if relevant) and any other requirements. This is especially the case where Dynamic Regulation is being introduced for the first time in a country, or the approach used is novel.
- In developing their application. In particular, stakeholders often need help with identifying the legislative/regulatory barriers that affect the innovation they are seeking to use.
- In bringing their project/trial to life. For example, they may require help identifying data owners and data access processes. Market participants may also require NRA support in engaging with network operators, where the latter may not prioritise innovation projects that do not directly benefit them.

### 3.1.6 Reporting, monitoring and evaluation

As with all public policy, effective Dynamic Regulation requires setting out upfront what would happen at the end of the initiative. For Dynamic Regulation, this is particularly important because the trials and experiments are intended to inform (the need for) future regulatory and/or legislative reform – e.g. to provide the NRA with new responsibilities or to introduce new forms of consumer protections. For this to be done effectively, the NRA<sup>44</sup> needs to **systematically collect evidence on the success or otherwise of each trial/experiment**. This requires the NRA to be clear with applicants about the reporting requirements that apply to any live projects under the Dynamic Regulation. On NRA’s side, sufficient attention should be paid to monitoring live projects – amongst other things, this is important for identifying any consumer harms early on and “stepping in”.

The exact form, timing and content of such evidence will depend on the aims and nature of each Dynamic Regulation initiative but, at a minimum, an evaluation should be conducted at

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<sup>44</sup> Or another competent authority.

the end of each Dynamic Regulation initiative. The evidence collected during and at the end of trials/experiments, as well as insights from running the Dynamic Regulation process itself, need to feed systematically into **evaluations of the Dynamic Regulation** and into policy assessments. Such assessment will identify:

- gaps in the current energy legislation/regulation that need to be addressed in light of insights from the Dynamic Regulation;
- barriers to innovations that have been identified through the Dynamic Regulation and which need to be addressed; and
- gaps in the Dynamic Regulation experiment that should be adapted.

To achieve the greatest social benefits, **as much of this information as possible should be made public**,<sup>45</sup> so that innovation can be promoted beyond just the participants of the trials / experiments.

### 3.1.7 Resourcing

Effective implementation and delivery of Dynamic Regulation initiatives requires a **considerable investment of time and effort by the NRA**<sup>46</sup> and by participating stakeholders. This, in turn, means that the NRA needs to have sufficient resourcing/funding to be able to take up the Dynamic Regulation initiative(s) while continuing to deliver its standard work. Some of the activities that are likely to be the most resource-intensive include development of the Dynamic Regulation, stakeholder engagement, assessment of applications, and monitoring of live projects.

## 3.2 Key decisions for using Dynamic Regulation

There is consensus that Dynamic Regulation should not be implemented as a one-size-fits-all approach. The right Dynamic Regulation activity would depend on the aims that are being sought, the current legislation / regulations, and the domestic energy market structure.

### 3.2.1 Degree of NRA involvement



Figure 5: The spectrum of options for the degree of NRA involvement in Dynamic Regulation

Source: CEPA review of case studies

Notes: Positions on the diagram are only illustrative. The relative positions of countries do not denote the quality or effectiveness of the respective Dynamic Regulation initiatives.

<sup>45</sup> The Platform for Exchange on CEER's website could be another channel to share information. See: CEER fit for innovation through Dynamic Regulation at: <https://www.ceer.eu/dynamic-regulation>

<sup>46</sup> Or another competent authority.

The figure illustrates only CEPA's assessment of the individual case studies reviewed. Please note that some of the countries listed above have implemented a variety of different types of Dynamic Regulation approaches. No comment is made here as to the characteristics of those approaches that are not the focus of the case studies.

NRAs play different roles, and have different competencies, in the Dynamic Regulation approaches that were reviewed. In some cases, they are the driving force behind the initiative (e.g. Italy and Ireland). In others, they are a facilitator of a service that is led by innovators, sometimes referred to as being demand-led (e.g. France and Lithuania). In a few cases, the NRA has a limited role or is primarily an observer of Dynamic Regulation led by another entity (e.g. the Netherlands). The main benefit of NRA-led approaches is that they tend to be very focused on resolving a well-defined problem (e.g. reliability at locations on the network). The main limitation is that these approaches are only as innovative as the NRA is able to conceive of. More radical innovators may be self-selecting not to participate in such initiatives owing to what may be perceived to be a restrictive scope.

In contrast, participant-led approaches have the potential to enable a wide variety of innovations and flag barriers that the NRA would not have been able to conceive of (as observed in the French case study). Such approaches may be characterised as being outcome-focused rather than problem-focused, which is also their main limitation – they may not be as effective as NRA-led Dynamic Regulation in finding a timely solution to a specific problem.

Dynamic Regulation initiatives led by NRAs were not more or less effective than those in which the NRA played more of a facilitating role. The most suitable approaches will depend on the existing allocation of responsibilities within the national energy sector governance, the aims of the Dynamic Regulation, and the availability of resourcing and expertise within the NRA and/or other stakeholders.

### 3.2.2 Scope of activities



*Figure 6: The spectrum of options for the scope of activities covered by Dynamic Regulation*

Source: CEPA review of case studies

Notes: Positions on the diagram are only illustrative. The relative positions of countries do not denote the quality or effectiveness of the respective Dynamic Regulation initiatives.

The figure illustrates only CEPA's assessment of the individual case studies reviewed. Please note that some of the countries listed above have implemented a variety of different types of Dynamic Regulation approaches. No comment is made here as to the characteristics of those approaches that are not the focus of the case studies.

The Dynamic Regulation approaches range from covering a very specific energy-related activity (e.g. community energy schemes in the Netherlands) to covering a potentially very broad range of activities in the energy sector (e.g. the sandboxes in Lithuania and GB). A general observation from the case studies is that Dynamic Regulation that is participant-led tends to have a broader scope, in order to allow for a wider set of innovations to be proposed.

NRA-led Dynamic Regulation initiatives typically have a narrower scope, reflecting the fact that the NRA is typically aiming to find a solution to a specific problem that has been identified.

The scope of activities covered by a Dynamic Regulation initiative is also likely to depend on the legal framework. The activities most commonly featured in the case studies related to the energy transition: integration of electric vehicles, household provision of flexibility services and participation in balancing services, local energy communities and peer-to-peer trading, and hydrogen use in gas networks.

### 3.2.3 Type of participants involved



Figure 7: The spectrum of options for the types of participants involved in Dynamic Regulation

Source: CEPA review of case studies

Notes: Positions on the diagram are only illustrative. The relative positions of countries do not denote the quality or effectiveness of the respective Dynamic Regulation initiatives.

The figure illustrates only CEPA's assessment of the individual case studies reviewed. Please note that some of the countries listed above have implemented a variety of different types of Dynamic Regulation approaches. No comment is made here as to the characteristics of those approaches that are not the focus of the case studies.

Most Dynamic Regulation approaches involve a degree of collaboration between different actors in the energy system. However, the Dynamic Regulation approaches can also be characterised as primarily being directed at one or more of the following groups: network operators; (incumbent) market participants; or new entrants. The choice depends on the aims of the Dynamic Regulation, given the separation of roles within the energy system. For example, if the aim is to address a matter that directly relates to the role of the TSO, the Dynamic Regulation would need to be targeted at the TSO and its activities.

This issue also interacts with the legal framework for the Dynamic Regulation – for example, it may be possible to implement initiatives that are only open to the TSOs or DSOs through standard tariff regulation processes, without the need for legislative changes. In contrast, providing exemptions from the requirement to unbundle generation from network operation may require the creation of a legal framework that allows the NRA to grant such exemptions.

### 3.2.4 Informing commercial decisions and/or informing regulatory policy

All Dynamic Regulation approaches seek to:

- 1) **promote innovation** – be it a new technology, business model or a regulatory process; and
- 2) **inform the need for future regulatory reforms.**

The balance of emphasis between these two aims may be different in different circumstances.

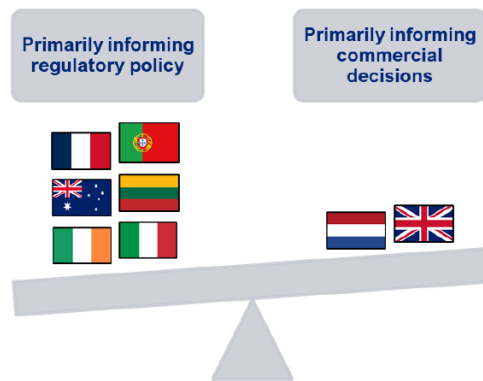


Figure 8: Options for the primary aim of Dynamic Regulation

Source: CEPA review of case studies

Notes: Positions on the diagram are only illustrative. The relative positions of countries do not denote the quality or effectiveness of the respective Dynamic Regulation initiatives.

The figure illustrates only CEPA's assessment of the individual case studies reviewed. Please note that some of the countries listed above have implemented a variety of different types of Dynamic Regulation approaches. No comment is made here as to the characteristics of those approaches that are not the focus of the case studies.

For example, the **British** sandbox's primary aim is to help innovators better understand how to make their innovations viable so as to enable market entry. The sandboxes developed in **France** and **Lithuania** place greater emphasis on the role of experimentation in informing regulatory reform. Broadly, there is a correlation between the extent to which a Dynamic Regulation initiative focuses on regulatory reform and the extent to which information is required to be made public. For example, under the British sandbox, protection of commercial confidence is emphasised and public reporting is relatively limited. The French and Lithuanian sandboxes place stronger requirements on making information about the trials public, and only restricting information by exception.



Figure 9: The spectrum of options for funding associated with Dynamic Regulation

Source: CEPA review of case studies

Notes: Positions on the diagram are only illustrative. The relative positions of countries do not denote the quality or effectiveness of the respective Dynamic Regulation initiatives.

The figure illustrates only CEPA's assessment of the individual case studies reviewed. Please note that some of the countries listed above have implemented a variety of different types of Dynamic Regulation approaches. No comment is made here as to the characteristics of those approaches that are not the focus of the case studies.

### 3.2.5 Funding provided

Also on funding, there is a variety of ways in which NRAs approach the question of whether Dynamic Regulation should include funding to the participants. These different approaches reflect:

- the different participants involved – funding is more often provided to network operators since their monopoly position means that there is no concern that provisions of funding will give them a competitive advantage; and
- the activities that are within scope – for example, the extent to which the Dynamic Regulation involves capital investment.

In addition to upfront funding, the Italian and Lithuanian case studies offer examples of rewards for successful innovation and (in the Italian case only) penalties for unsuccessful innovation.

It is important to note that the funding is temporary and not structural. **Dynamic Regulation can be used to help test innovations to see whether they are fit for the market, but should not be used to provide constant financial support.**

## 4 Conclusions

Dynamic Regulation can be considered the manner in which NRAs enable the regulation to evolve over time, but do so in a predictable way, whilst also keeping the regulatory framework stable in order to enable innovation. NRAs are of the view that all the tools at their disposal to allow for innovation and efficient regulation of the energy markets shall be utilised, particularly for EU Member State (MS) NRAs to cope with the new European challenges in implementing the European Green Deal<sup>47</sup>.

Based on case studies of implementation of a variety of different types of Dynamic Regulation approaches and an in-depth review of applications of Dynamic Regulation in the energy sector of several MS, as well as two non-EU countries made in this report, it can be concluded that **the processes in place** usually go through the following steps:

- Enabling the Dynamic Regulation (legal framework)
- Setting up the Dynamic Regulation
- Application
- Assessment
- Awarding entry to the Dynamic Regulation
- Project delivery
- Project reporting and close out
- Feedback into regulatory decision

**How Dynamic Regulation is implemented** can be concluded as follows:

- the NRA granted a derogation or exemption to facilitate the trials or experiments;
- Dynamic Regulation was also enabled as a part of the NRA's standard tariff-setting process without a need for a specific derogation;
- the NRA specifies an upfront (ex-ante) detailed set of aims and criteria, which form the boundaries for experimentation that happens in parallel to the standard regulation, thus avoiding the need to grant case-by-case derogations.

The **common aims** of Dynamic Regulation are the promotion of **consumers' interest**, enabling the decarbonisation of the energy system and enabling innovation (including in the form of competition/market entry). **Consumer protection is key**: innovation necessarily involves a higher degree of risk and likelihood of "failure" than regulators would typically be comfortable with. Depending on the innovation, such failures could include higher than expected costs, technological and contractual lock-in that limit consumer choice, deterioration in reliability of supply and worse safety of energy services.

When setting out who can use the tools on offer in Dynamic Regulation, there are two different approaches: those that are aimed at network operators, and those that are open to a broader range of market participants.

The **three common types of enabling environments** for Dynamic Regulation include; 1) flexibility within the legal framework that applies to market participants and implemented by the NRA 2) flexibility within NRA's tariff-setting processes that apply to network companies and 3) introduction of specific legislation

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<sup>47</sup> See [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)



Another key difference in the enabling framework for Dynamic Regulation is the **length of time** for which the exemption or trial is granted; the timeframes that apply to experiments and trials varied in different cases from 1 to 4 years.

There are different ways of NRAs involvement in the implementation of Dynamic Regulation. Some NRAs were driving the process, while others acted as a facilitator. The role an NRA can play in Dynamic Regulation will depend on the scope of activities for which the NRA is the competent authority, as well as the level of discretion autonomy the NRA has under national legislation.

There are also differences between cases on the funding and incentives provided by an NRA to participate in experiments or trials going from no funding provided to rewards and risk of penalties and other types of incentives. The role of the stakeholder is also different; from active and direct engagement to limited involvement and/or collaboration.

The **impact of Dynamic Regulation** is that the network managements such as the services provided by the grid operators are improved and consumer preferences become more central in decision making. In setting Dynamic Regulation, NRAs often stress the need for innovators or participants to focus on the consumer impacts of their innovation, whereas it is important to note that some of the cases currently do not have live trials.

The report also proposes **recommendations addressed to NRAs** in order to better cope with Dynamic Regulation challenges. It is necessary to have clarity on the objectives of the Dynamic Regulation initiative and to have a suitable enabling framework such as clear and appropriate allocation of roles. Furthermore, it is important to have clarity on the selection and approval process. It is key to ensure that consumer protection and involvement are taken into account in the projects. A successful Dynamic Regulation initiative also implies a clear communication and provision of support to interested participants and stakeholders. To better profit from the initiatives, it is fundamental to build in at the outset requirements for reporting, monitoring and evaluation, but also to ensure that responsible NRAs are properly resourced.

Legal constraints can often be a challenge for Dynamic Regulation; therefore, the process must help to identify needs for legal reform and create a feedback loop. This is why a key eligibility criterion in the case studies is that applicants need to specify which regulations currently act as a barrier to their proposed innovation.

The fact that NRAs have introduced or taken on a Dynamic Regulation initiative demonstrates institutional willingness to find ways for the NRA to keep in step with the times and better support innovation.

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## Annex 1 – List of Abbreviations

Acronym	Full name
ACM	Authority for Consumers & Markets (the Netherlands)
AER	Australian Energy Regulator
ARERA	Autorità di Regolazione per Energia Reti e Ambiente (Italian NRA)
CEER	Council of European Energy Regulators
CRE	Commission de Régulation de l'Énergie (French NRA)
CRU	Commission for Regulation of Utilities (Ireland)
DR	Dynamic Regulation
DSO	Distribution System Operator
EE	Experimenten Elektriciteitswet (The Netherlands)
ENTSO-E	European Network of Transmission System Operators for electricity
ENTSO-G	European Network of Transmission System Operators for gas
ERSE	Entidade Reguladora dos Serviços Energéticos (Portuguese NRA)
EU	European Union
GB	Great Britain
MV	Medium voltage (electricity network)
MS	Member States
NRA	National Regulatory Authority
PR4 / PR5	Price Review 4 / 5 (Ireland; only used in the annex)
RVO	Netherlands Enterprise Agency
SIF	Strategic Innovation Fund (Ireland)
TSO	Transmission System Operator
VERT	Valstybinė energetikos reguliavimo taryba (Lithuanian NRA)

## Annex 2 – Case Studies on Dynamic Regulation implemented by NRAs

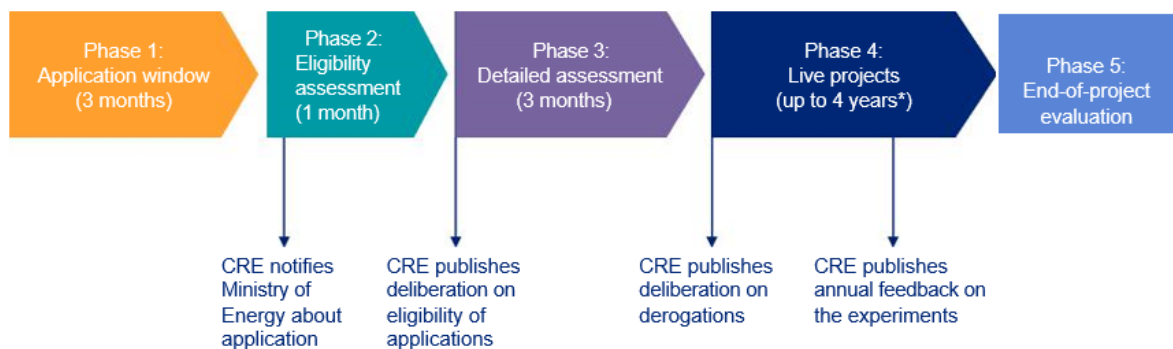
<b>FRANCE</b>	Regulatory Sandbox										
Case Study Name	Regulatory Experimentation System (sandbox) In French: <i>Dispositif d'expérimentation réglementaire</i>										
Key Features	<table border="1"> <thead> <tr> <th>Degree of NRA involvement</th> <th>Scope of activities</th> <th>Type of participants involved</th> <th>Primary aim</th> <th>Funding</th> </tr> </thead> <tbody> <tr> <td>NRA as facilitator</td> <td>Limited to access and use of networks</td> <td>Any participant, as long as project involves access or use of networks</td> <td>Informing regulatory policy</td> <td>None provided</td> </tr> </tbody> </table>	Degree of NRA involvement	Scope of activities	Type of participants involved	Primary aim	Funding	NRA as facilitator	Limited to access and use of networks	Any participant, as long as project involves access or use of networks	Informing regulatory policy	None provided
Degree of NRA involvement	Scope of activities	Type of participants involved	Primary aim	Funding							
NRA as facilitator	Limited to access and use of networks	Any participant, as long as project involves access or use of networks	Informing regulatory policy	None provided							
Description	<p>The regulatory sandbox allows the <i>Commission de Régulation de l'Energie</i> (CRE) to grant exemptions to the conditions of access to and use of energy networks, and facilities for the experimental deployment of innovative technologies or services that could support the energy transition, smart grids and infrastructures. The sandbox provides a legal framework that allow testing of innovations that would ultimately require changes to the applicable regulatory and legislative framework.</p> <p>To date, one application round has been completed, with CRE giving derogations to nine out of 42 applications received. Among the 42 applications received, 10 were transmitted to the <i>Direction Générale de l'Energie et du Climat</i> (DGEC) which is competent to grant the derogations. To date, DGEC has given 1 derogation and 6 are still under investigation. A second application window was open from 15 September to 31 December 2021.</p> <p>The sandbox is characterised by high levels of collaboration. Firstly, between the CRE and DGEC, who are separately or jointly the 'competent authority' for granting a sandbox derogation. Secondly, between CRE, applicants and network operators, since the scope of experiments relates to access and use of the networks. Combined with this is a high level of transparency about sandbox projects.</p>										

### Implementation

What is the role of the NRA?	<p>CRE acts as a "central facilitator" of the sandbox:</p> <p>First, it is responsible for initiating invitations for sandbox applications. It then engages with prospective applicants to help them identify the regulatory barriers that would necessitate a derogation.</p> <p>Next, CRE is responsible for assessing the applications against eligibility criteria that it had set (see section on 'scope of activities' below), and identifies the competent authority with respect to each eligible application (see section on 'key stakeholders' below). The competent authority is either CRE, DGEC, or both CRE and DGEC jointly.</p>
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	<p>CRE then carries out a detailed assessment of eligible applications for which it is the competent authority and grants derogations (CRE may decide on the exact scope of the experimentation that is permissible, for example with regard to the number of participants or the geographical area).</p> <p>Lastly, CRE monitors and evaluates the projects that have been granted a derogation.</p> <p>CRE is sometimes involved in projects after granting derogations, such as in facilitating agreements between the trial leader and the respective network operator. This is not a legal requirement but rather a pragmatic decision made to help trials get off the ground.</p>
<p>How is DR enabled?</p>	<p>The Energy-Climate Law, which came into effect on 8 November 2019, introduced a regulatory sandbox in the energy sector. Experiments conducted under the sandbox must contribute to the achievement of the energy policy objectives defined in article L. 100-1 of the Energy Code. The energy policy objectives set out in the code are:</p> <ul style="list-style-type: none"> <li>• Enabling the rise of a competitive economy and the development of employment.</li> <li>• Enabling security of supply and the reduction of the reliance on imports.</li> <li>• Enabling a competitive and attractive price for energy.</li> <li>• Enabling the protection of human health and of the environment.</li> <li>• Participating in the social and territorial cohesion.</li> <li>• Participating in the fight against energy poverty.</li> <li>• Contributing to the rise of the 'European Energy Union' which aims to guarantee security of supply and build a decarbonised and competitive economy, through the development of renewable energies, physical interconnections, means of flexibility in the electricity system, support for improved energy efficiency and the establishment of instruments for coordinating national policies.</li> </ul> <p>Derogations cannot be granted if they are likely to contravene the proper accomplishment of the public service missions of network operators, or to undermine the security and safety of the networks or the quality of their operation. In addition, derogations must comply with the provisions of EU law, as well as EU and public order provisions of national law.</p> <p>The CRE is able to define “themes” under which sandbox applications should be made. However, the first application window was made deliberately broad by CRE in order to encourage a range of innovative applications. The second application window is also not restricted to specific themes.</p>

<p>Who are the other key stakeholders?</p>	<p>DGEC is the competent authority for granting some of the derogations sought under the sandbox. In the first application window, CRE determined that DGEC was the sole competent authority in relation to ten out of the 20 applications that were deemed eligible. CRE and DGEC were jointly the competent authorities for a further eight of the eligible applications. Additionally, DGEC received three applications directly.</p> <p>The Minister of Energy is informed by CRE when new applications come in, and has a two-month period in which to object to any application being granted a derogation.</p> <p>Network operators (TSOs, DSOs and energy distribution organising authorities (AODEs)) can be consulted on sandbox applications that CRE deems eligible. This reflects the fact that a network operator would often need to be involved in an experiment that is granted under the sandbox.</p>
<p>What does the DR seek to achieve?</p>	<p>From discussions with CRE staff, the sandbox was intended as a way of formalising the regulatory structure around experimentations that involved network access or use, with some such experiments having taken place previously. The formal structure allows CRE to follow the experimentations and get regular feedback. It also ensures that network operators would not be able to refuse stakeholders' requests for experimentations.</p> <p>The sandbox is not intended to replace any subsidy or state aid mechanisms. For example, CRE is clear that projects that simply request an exemption from network tariffs would not be considered eligible.</p>
<p>Process for applying the DR</p>	<p>CRE has set out a five-phase process for sandbox projects, as illustrated in the figure below:</p>



\* Derogations may be renewed once for a maximum for 4 additional years  
Source: CEPA based on CRE (2021)

	<p>The process consists of:</p> <ul style="list-style-type: none"> <li>• Application window (three months): During this stage applicants can obtain information from CRE, in particular through an FAQ on a dedicated page of the CRE website and a dedicated mailbox. To</li> </ul>
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	<p>move on to the next phase, it is necessary to submit a complete application.</p> <ul style="list-style-type: none"> <li>• Eligibility assessment (~one month): CRE determines eligible projects. This may involve meeting with project leaders in order to understand the details of the projects. Projects are either: <ul style="list-style-type: none"> <li>○ Deemed not eligible because it does not meet the criteria defined by CRE. CRE will include a description of the project in its published deliberations, subject to confidentiality requirements of the project leader.</li> <li>○ Deemed to be eligible and progresses to the detailed assessment phase.</li> </ul> </li> <li>• In-depth assessment (~three months): CRE may request additional information from applicants and may consult with the relevant network operators and AODEs. At the end of this analysis and once the Minister's opposition period has passed, CRE will publish its decision on which projects should be granted a derogation. To date CRE has also published alongside its own decisions the approval or rejection of applications for which DGEC is the competent authority.</li> <li>• Experimentation: A progress report is sent to CRE at least once a year by the project leader. The law allows for exemptions for a maximum of four years that may be renewed once.</li> <li>• End of the experimentation period: Based on feedback and the results of the experimentation, CRE may propose regulatory or legislative changes to address any obstacles identified during the experiment and the observed benefits of the project. CRE also publishes an assessment of the experiment.</li> </ul>
<p>Scope of activities</p>	<p>Derogations can only relate to conditions of access and use of the electricity and gas networks. Moreover, CRE has set the following eligibility criteria for projects that request a derogation:</p> <ul style="list-style-type: none"> <li>• Projects must contribute to the energy policy objectives defined in article L. 100-1 of the energy code.</li> <li>• Projects must present an innovative dimension.</li> <li>• Projects face a clearly identified legislative or regulatory obstacle.</li> <li>• Projects present a potential for subsequent deployment, in particular if the experiment achieves its objectives.</li> <li>• Projects present a benefit to the community if the solution is deployed in the long term.</li> </ul>
<p>Status</p>	<p>The first application window was open from June to September 2020. 42 applications were received by CRE, of which CRE deemed 20 to be cumulatively eligible. In March 2021, at the end of the analysis phase, CRE granted derogations to nine projects out of ten for which it was the competent authority (for seven of these projects, CRE and DGEC were jointly the competent authorities) and DGEC granted 1 derogation. 6 projects are still under the investigation by the DGEC. Additionally, DGEC received three applications directly and granted two derogations among them.</p>

	<p>The following projects were granted a derogation in the first window:</p> <ul style="list-style-type: none"> <li>• EDF SA – Derogation to facilitate participation from storage to system services</li> <li>• Engie – Derogation to develop local flexibilities through the implementation of an innovative network tariff</li> <li>• Seven applications to apply the same legal framework to injection of synthetic methane into the networks as applies to biomethane injections.</li> <li>• The second application window was opened in September 2021 and would be open until 14 January 2021. CRE has stated that applications that request identical derogations to those granted during the first window would be deemed ineligible unless they offered a new innovative dimension not already covered by the existing derogations.</li> </ul>
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#### Impact

What results have been observed?	<p>No projects from the first window are currently live, so it is too early to identify the impact of projects. However, CRE staff have identified the following benefits from the process of the first application window itself:</p> <ul style="list-style-type: none"> <li>• Establishing contact between CRE and innovators, which has allowed CRE to engage in discussions with stakeholders it would not typically have. This, in turn, has: <ul style="list-style-type: none"> <li>○ helped reveal regulatory barriers to innovation that would not have otherwise been known to CRE; and</li> <li>○ enabled CRE to explain the regulations and help stakeholders understand that some of the proposed activities are already permissible and do not require a sandbox.</li> </ul> </li> <li>• Creating a basis for CRE to engage with other NRAs to discuss sandbox regulation.</li> </ul>
Consumer impacts	<p>CRE has observed that derogations granted in the first window could benefit consumers through the adoption of local flexibility services.</p>
Other impacts	<p>As a result of the first application window, CRE identified four major issues that relate to the future of the electricity system:</p> <ul style="list-style-type: none"> <li>• participation of storage in system services;</li> <li>• the inclusion of electric vehicles in the electrical system;</li> <li>• use of data from advanced meters; and the optimisation of the connections of renewable energy to the networks.</li> </ul>

#### Lessons

Strengths	<p>The sandbox process is characterised by a high degree of collaboration. This, in turn, supports the transparency of the sandbox process. The publication of key performance indicators (KPIs) on an annual basis for projects that received a derogation further supports transparency.</p>
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	The phased process, with an eligibility assessment preceding the detailed assessment, has proved effective in the first application window. It enabled engagement between CRE and network operators to focus on projects that met the eligibility criteria.
Challenges	<p>The volume of applications received in the first window – with the majority being submitted at or near the deadline – created an administrative burden on CRE. Almost 20 applications did not specify the legislative or regulatory provisions to which a derogation was required, and 15 applications were for projects that fell outside the scope of the sandbox. To avoid this issue during the next round, CRE has asked stakeholders to make contact with CRE before the end of the application window.</p> <p>Some stakeholders told CRE that the separation of responsibilities between the NRA and DGEC, with each organisation each following a different process, introduced complexity and results in a lack of clarity about the process. Considering the scope of the sandbox some projects may lead to consultation with the network operator.</p>
Conditions for success	<ul style="list-style-type: none"> <li>• <b>Transparency</b> – CRE made a concerted effort to make the application and approval process clear, understandable and legitimate.</li> <li>• <b>Communication</b> – CRE undertook extensive stakeholder engagement (e.g. webinars) to explain the sandbox process. In the second application window it is working with applicants to identify the relevant regulatory barriers for prospective projects.</li> </ul>

#### Sources

List of interviewees	Guillaume Magnien, Analyst, Connections and Smart Grids Department, CRE Guillaume Bullier, Analyst, Connections and Smart Grids Department, CRE Natalia Baudry, Policy Officer, Directorate for European & International Affairs and cooperation, CRE
Bibliography	<p>CRE (2020), <i>Consultation publique de la Commission de régulation de l'énergie en date du 30 janvier 2020 sur la mise en œuvre du dispositif d'expérimentation prévu par la loi relative à l'énergie et au climat</i>, January. Accessed at: <a href="https://www.cre.fr/Documents/Consultations-publiques/mise-en-oeuvre-du-dispositif-d-experimentation-prevu-par-la-loi-relative-a-l-energie-et-au-climat">https://www.cre.fr/Documents/Consultations-publiques/mise-en-oeuvre-du-dispositif-d-experimentation-prevu-par-la-loi-relative-a-l-energie-et-au-climat</a></p> <p>CRE (2020), <i>Délibération de la Commission de régulation de l'énergie en date du 4 juin 2020 portant décision sur la mise en œuvre du dispositif d'expérimentation réglementaire prévu par la loi relative à l'énergie et au climat</i>, June. Accessed at: <a href="https://www.cre.fr/Documents/Deliberations/Decision/mise-en-oeuvre-du-dispositif-d-experimentation-reglementaire-prevu-par-la-loi-relative-a-l-energie-et-au-climat">https://www.cre.fr/Documents/Deliberations/Decision/mise-en-oeuvre-du-dispositif-d-experimentation-reglementaire-prevu-par-la-loi-relative-a-l-energie-et-au-climat</a></p>



	<p>CRE (2021), <i>Délibération de la Commission de régulation de l'énergie 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</i>, July. Accessed at: <a href="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-ouverture">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-ouverture</a></p> <p>CRE (2021), Case study of using regulatory sandboxes to support innovative projects in France, Presentation by Natalia Baudry at CEER Workshop on Dynamic Regulation, 25<sup>th</sup> June 2021. Accessed at: <a href="https://www.ceer.eu/documents/104400/7244045/Natalia_Baudry+-+French+Regulatory+sandbox+CEER+DR+workshop.pdf/c33f8cef-580e-4ce9-4ff5-f117ac2d204f?version=1.0">https://www.ceer.eu/documents/104400/7244045/Natalia_Baudry+-+French+Regulatory+sandbox+CEER+DR+workshop.pdf/c33f8cef-580e-4ce9-4ff5-f117ac2d204f?version=1.0</a></p> <p>CRE (2021), Regulatory Sandbox web page, Accessed on 19 November 2021 at: <a href="https://www.cre.fr/en/Energetic-transition-and-technologic-innovation/regulatory-sandbox">https://www.cre.fr/en/Energetic-transition-and-technologic-innovation/regulatory-sandbox</a></p>
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<b>Ireland</b>	DSO Strategic Innovation Funding														
Case Study Name	Strategic Innovation Fund (SIF)														
Key Features	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Degree of NRA involvement</th> <th style="width: 15%;">Scope of activities</th> <th style="width: 15%;">Type of participants aim involved</th> <th style="width: 15%;">Primary</th> <th style="width: 15%;">Funding</th> </tr> </thead> <tbody> <tr> <td>NRA driving the process</td> <td>Low-carbon energy projects and DSO's own innovation capabilities</td> <td>The fund was only available to the DSO</td> <td>Informing regulatory policy</td> <td>€20 million each year of the regulatory period, subject to claw-back for under-delivery of innovation projects</td> </tr> </tbody> </table>					Degree of NRA involvement	Scope of activities	Type of participants aim involved	Primary	Funding	NRA driving the process	Low-carbon energy projects and DSO's own innovation capabilities	The fund was only available to the DSO	Informing regulatory policy	€20 million each year of the regulatory period, subject to claw-back for under-delivery of innovation projects
Degree of NRA involvement	Scope of activities	Type of participants aim involved	Primary	Funding											
NRA driving the process	Low-carbon energy projects and DSO's own innovation capabilities	The fund was only available to the DSO	Informing regulatory policy	€20 million each year of the regulatory period, subject to claw-back for under-delivery of innovation projects											
Description	<p>The SIF was developed by Commission for Regulation of Utilities (CRU) in early 2016 following the publication of its Price Review 4 (PR4) Decision. SIF provides funding for research, development, demonstration and adoption of innovative technologies, as well as operating and commercial arrangements. The fund is designed to facilitate major change within the DSO<sup>48</sup> organisation and network to meet the challenges and opportunities that the DSO will face as the Irish economy decarbonises – such as an increased share of renewable energy, as well as information and data changes.</p>														

<sup>48</sup> ESB Networks is the licenced DSO in Ireland.

	<p>The value of the SIF for PR4 was set at €100m; €20m for each year of the regulatory period (2016-2020). CRU reviewed the DSO's SIF submissions on an annual basis, with up to €15m of the annual allowance at risk of being disallowed if CRU found the DSO's submissions not to meet expectations. This acts as a financial incentive to drive innovation by the DSO. The CRU's assessment and decision on the financial reward were aligned with outcomes that are valuable for consumers – i.e. socially beneficial projects that are demonstrably not business-as-usual activities for the DSO (and therefore funded elsewhere in the price review).</p>
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### Implementation

<p>What is the role of the NRA?</p>	<p>The CRU established the SIF and determined the total amount of funding available. During PR4, the CRU monitored and evaluated how the DSO used the money granted under the SIF by assessing an annual report by the DSO. This is further explained below in the section titled "Process for applying the DR".</p>
<p>How is DR enabled?</p>	<p>No changes were required to the legislation governing the CRU, as the SIF was already within scope of its duties. Also, no changes were needed to the DSO's licence as the existing licence conditions are broad. The CRU's discretion extended, for example, to specific trials such as the Dingle Project – a major initiative funded via the SIF. The trial involved activities that the CRU characterises as being "outside the norm" for the DSO. However, the CRU decided to treat these activities as a pilot, meaning that they did not require a licence change.</p>
<p>Who are the other key stakeholders?</p>	<p>The SIF did not involve a formal role for third parties. However, the CRU sought for the DSO to explore partnership opportunities for initiatives funded via the SIF.</p> <p>The DSO has set up an Innovation Stakeholder Panel in 2020 which, according to the CRU, consists of approximately 19 members. The CRU considers that the panel has had a positive impact on the DSO's submissions.<sup>49</sup> More generally, CRU noted that it is unaware of stakeholder complaints about being left out of innovation discussions with the DSO. Additionally, ESB Networks has been involved in the European Commission's Horizon 2020 programme, and has partnered with local communities and with suppliers (e.g. on smart services).</p> <p>Through the Dingle Project, the DSO is engaging a wide assortment of stakeholders, including local community groups, local councils, academics, electricity suppliers, education and training bodies, industry groups and equipment providers.</p>

<sup>49</sup> Note that the Innovation Stakeholder Panel was only formally established towards the end of PR4.

<p>What does the DR seek to achieve?</p>	<p>The SIF was aimed at generating new initiatives that would provide increased value for money and better services to customers, accelerate the move to a low carbon energy sector, and deliver other environmental benefits.</p> <p>The CRU's PR4 Decision Paper gave the following example for potential areas of focus of the SIF:</p> <ul style="list-style-type: none"> <li>• Continuing increases in renewable generation</li> <li>• Demand side participation</li> <li>• Empowerment of electricity consumers</li> <li>• TSO – DSO interaction and flexibility</li> <li>• Using new sources of data and trialling new practices to improve network performance</li> <li>• Leveraging smart meters (Smart Grids)</li> </ul>
<p>Process for applying the DR</p>	<p>Funding under the SIF was provided by the CRU on <i>ex ante</i> basis, and was subject to an annual assessment by the CRU, which could result in some of the funding being clawed back via the next year's network tariffs. The CRU assessed:</p> <ul style="list-style-type: none"> <li>• the quality of the process to identify innovation;</li> <li>• the efficiency in delivery of innovative projects; and</li> <li>• the way that project learnings or outcomes have been used by the DSO.</li> </ul> <p>The assessment was based on an annual submission by the DSO, consistent with CRU guidance. The evidence presented in each year was to be consolidated by the CRU into an overall assessment of "strong", "adequate" or "weak". An adequate score resulted in €5m being clawed back, and a "weak" score resulted in €15m being clawed back.</p>
<p>Scope of activities</p>	<p>The first main innovation project was the Dingle Project in 2018. This included the deployment and implementation of technologies such as solar PV systems, battery management systems, air source heat pumps, energy monitoring systems, electric vehicles and smart electric vehicle chargers. The DSO also invested in an Energy Mentor Course to educate residents on renewable energy.</p> <p>Projects also trialled peer-to-peer energy trading and digital platform strategies, such as apps to support all technical trials.</p>

<p>Status</p>	<p>For the current regulatory period - PR5 (2021-2025) - the CRU has replaced SIF with an Innovation and R&amp;D mechanism. The CRU has kept the reporting element of the SIF, but considers that the SIF itself has been effective in enabling the organisational capability, structures and governance of innovation within the DSO, meaning that there is no longer the same need for specific funding of these. PR5 represents a shift in emphasis from the process to innovate (which was core to the SIF) towards more of a focus on the outcomes delivered by the DSO through innovation.</p> <p>Separately, CRU looked into the possibility of introducing a regulatory sandbox but decided against it. This is due to the CRU concluding that the expected benefits were relatively small compared to the potential for excessive administrative burden.</p>
<p>What results have been observed?</p>	<p>The DSO estimates that, during PR4 (2016 – 2020), €60m was saved from a programme of 83 innovation projects.</p> <p>A key aim of the SIF was to prepare the DSO for PR5. CRU considers that the DSO's business plan submission for PR5 represented a clear improvement compared to PR4 in setting out what the DSO is setting out to deliver and what funding was needed. CRU characterises these as the “need” and “additionality” of expenditure. The third element is the efficiency of expenditure; the CRU did not observe a real impact from the SIF on the efficiency of funding requests – but acknowledges that improving cost efficiency was not a direct aim of the SIF.</p> <p>For PR5, CRU has incorporated some of the concepts that were trialled under the SIF into the overall regulatory framework. For example, the DSO was provided with funding to carry out large-scale procurement of flexibility services as an alternative to traditional network reinforcement. The funding is accompanied by an incentive that rewards or penalises the DSO for setting up effective processes and systems for large-scale procurement of flexibility, including the DSO's role in developing a market for such services.</p>
<p>Consumer impacts</p>	<p>As a result of the Dingle Project, the DSO has an increased visibility of the MV Network, contributing to increased reliability in that part of the system. There is also increased remote control and automation of the MV network devices, which enables faster customer restoration times in the event of power outages. This allows for reduced Customer Interruptions and reduced Customer Minutes Lost. At the LV part of the network, installation of Vision Devices enable remote monitoring of customer transformers and make decisions on application of electrical loads. This supports faster response times to customers' requests for increased loads.</p>

Other impacts	<p>As noted above, the primary aim of the SIF was to enhance the DSO's organisation capability and capacity to undertake the innovation required to support a decarbonised electricity system. Initially, CRU felt that the DSO could have been more systematic in its approach to innovation, evaluation and reporting. For example, with regard to decisions on which projects to continue and which projects to stop. However, CRU observed improvement in this regard over time and is much clearer that the DSO is now taking a structured approach.</p> <p>CRU also noted the DSO's improved capacity to think about and develop innovation projects, and consider that there is a better governance structure around innovation.</p> <p>CRU considers that the DSO is now more clearly focused on consumer benefits in its approach to innovation, and that there is greater clarity on innovation being different to business-as-usual, with the DSO more willing to take on risk. CRU also observed that the DSO is looking internationally more and is now participating in innovation programmes run by the GB Energy Networks Association (ESB Networks is an observer) and Eurelectric.</p>
Strengths	<p>The SIF was able to drive the key outcome for which it was designed – increasing the DSO's organisational capability and capacity to undertake innovation – because the mechanism was directly targeted at the DSO and because of the amount of funding involved. The sums of money involved were material in the context of the overall PR4 revenue allowance, ensuring that accountability was established and attention was paid to innovation at senior levels within ESB Networks.</p> <p>The CRU noted that the DSO would not have been able to put together the innovation work package planned for PR5, nor launch it soon after the PR5 allowances were signed off,<sup>50</sup> if not for the improved organisational capacity and capability developed under the SIF.</p>
Challenges	<p>Limited third-party involvement in individual projects: while noted as one of the reasons the SIF has been successful, the DSO-centric nature of the mechanism (the funding is only available to the DSO and cannot be accessed by other organisations) may have been a factor in the relative lack of collaborations on innovation projects.<sup>51</sup></p> <p>This issue may be further compounded by the small size of the Irish market, where there are only a few organisations with the capability to engage with the DSO – for example, in providing flexibility from distributed energy resources. CRU considered that partnerships could have been developed more, particularly in the early years of PR4.</p>

<sup>50</sup> ESB Networks launched the 'National Network, Local Connections' programme in September 2021. The programme is aimed at developing the DSO's capabilities to use local flexibility.

<sup>51</sup> The types of projects trialled under the SIF, such as local flexibility services, would always require involvement of the DSO.

	<p>Another challenge is possibly not enough risk-taking – when it comes to innovation, too many successful projects may indicate not enough risk being taken.</p> <p>At the start of the SIF there was the inclusion of non-innovation projects. There was a need for engagement between the CRU and DSO on what was innovative.</p>
<p>Conditions for success</p>	<p><b>Accountability</b> – there was a significant amount of money at risk if the DSO did not meet the CRU’s assessment criteria. This provided incentives and generated senior level interest in the SIF within the DSO.</p> <p><b>Clarity on CRU’s recommendations and expectations</b> – the CRU provided annual feedback that was targeted at areas of perceived deficiency, but was not overly prescriptive about the way in which the DSO needed to address those deficiencies.</p>
<p>List of interviewees</p>	<p>Robert O’Rourke; Manager; CRU Conor McEvoy; Senior Analyst; CRU</p>
<p>Bibliography</p>	<p>CRU (2015), Decision on DSO Distribution Revenue for 2016 to 2020, Decision Paper, December. Available at: <a href="https://www.cru.ie/wp-content/uploads/2015/07/CER15295-Decision-on-DSO-PR4-Distribution-Revenue-2016-to-2020.pdf">https://www.cru.ie/wp-content/uploads/2015/07/CER15295-Decision-on-DSO-PR4-Distribution-Revenue-2016-to-2020.pdf</a></p> <p>CRU (2017), Reporting and Incentives under Price Review 4, Consultation, December. Available at: <a href="https://www.cru.ie/wp-content/uploads/2017/12/CRU17335-Consultation-on-Reporting-and-Incentives-under-Price-Review-4.pdf">https://www.cru.ie/wp-content/uploads/2017/12/CRU17335-Consultation-on-Reporting-and-Incentives-under-Price-Review-4.pdf</a></p> <p>CRU (2017), Reporting and Incentives under Price Review 4, Decision, December. Available at: <a href="https://www.cru.ie/wp-content/uploads/2018/05/CRU18087-Reporting-and-Incentives-under-Price-Review-4-Decision-Paper.pdf">https://www.cru.ie/wp-content/uploads/2018/05/CRU18087-Reporting-and-Incentives-under-Price-Review-4-Decision-Paper.pdf</a></p> <p>CRU (2019), Electricity Distribution Network, Allowed Revenue 2020, Distribution Tariffs 2019/2020 &amp; Distribution Loss Adjustment Factors, Information Paper, August. Available at: <a href="https://www.cru.ie/wp-content/uploads/2019/08/CRU19102-Electricity-Distribution-Tariffs-2019-2020-DLAFs.pdf">https://www.cru.ie/wp-content/uploads/2019/08/CRU19102-Electricity-Distribution-Tariffs-2019-2020-DLAFs.pdf</a></p> <p>CRU (2020), The Electricity Distribution Network Allowed Revenues for 2021 and the Distribution Use of System (DUoS) Tariffs &amp; Distribution Loss Adjustment Factors (DLAFs) for 2020/21, Information Paper, July. Available at: <a href="https://www.cru.ie/wp-content/uploads/2020/08/CRU20084-The-Electricity-Distribution-Network-Allowed-Revenues-for-2021-and">https://www.cru.ie/wp-content/uploads/2020/08/CRU20084-The-Electricity-Distribution-Network-Allowed-Revenues-for-2021-and</a></p>

<p><a href="#">the-DUoS-Tariffs-DLAFs-for-2020-21-1.pdf</a></p> <p>ESB Networks (2020), Distribution Annual Performance Report 2020, December. Available at: <a href="https://www.esbnetworks.ie/docs/default-source/publications/distribution-annual-performance-report-2020-public-consultation.pdf?sfvrsn=f4687953_15">https://www.esbnetworks.ie/docs/default-source/publications/distribution-annual-performance-report-2020-public-consultation.pdf?sfvrsn=f4687953_15</a></p> <p>ESB Networks (2020), The Dingle Electrification Project: sharing learnings from the Peer-to-Peer Energy Trading Objective, December. Available at: <a href="https://www.esbnetworks.ie/docs/default-source/publications/the-dingle-electrification-project---sharing-learnings-from-the-peer-to-peer-energy-trading-objective.pdf?sfvrsn=211af907_15">https://www.esbnetworks.ie/docs/default-source/publications/the-dingle-electrification-project---sharing-learnings-from-the-peer-to-peer-energy-trading-objective.pdf?sfvrsn=211af907_15</a></p> <p>ESB Networks (2021), Web page on the Dingle Project. Accessed on 25 November 2021 at: <a href="https://www.esbnetworks.ie/who-we-are/innovation/esb-networks'-dingle-project/project-updates">https://www.esbnetworks.ie/who-we-are/innovation/esb-networks'-dingle-project/project-updates</a></p>
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<b>ITALY</b>	Regulatory experiments – DSO quality of service incentive				
Case Study Name	DSO quality of service incentive (regulatory experiments) In Italian: <i>Esperimenti Regulatori sulla Qualità del Servizio</i>				
Key Features	<b>Degree of NRA involvement</b>	<b>Scope of activities</b>	<b>Type of participants involved</b>	<b>Primary aim</b>	<b>Funding</b>
	NRA driving the process	Regulatory experiment limited to the reliability incentive	Available to DSOs	Informing regulatory policy	Rewards and risks of penalties
Description	The Italian NRA ARERA has been using a number of Dynamic Regulation approaches as it seeks to establish a regulatory environment that supports innovation, with the need to support innovation being driven by the power system transformation to a decarbonised system. ARERA's use of 'pilot projects' and 'pilot regulation' are, respectively, covered in detail in the ISGAN regulatory innovations casebooks from 2019 and 2021. So in this case study the focus was on 'regulatory experiments' that ARERA has introduced with regard to network reliability incentive measures that are applied to the DSOs.				

	<p>The standard incentive is based on profiled targets of reliability improvement for each four-year regulatory period. Under the experiment, a DSO may avoid the standard quality of service incentive in critical areas of the network by proposing an alternative profile as long as the final year's target is the same as under the standard incentive. If the DSO does not meet the final year's target, it faces the same penalties that it would have under the standard incentive. If the DSO outperforms the target, its rewards are calculated according to the alternative profile, and capped at the level that would have been achieved under the standard incentive.</p>
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### Implementation

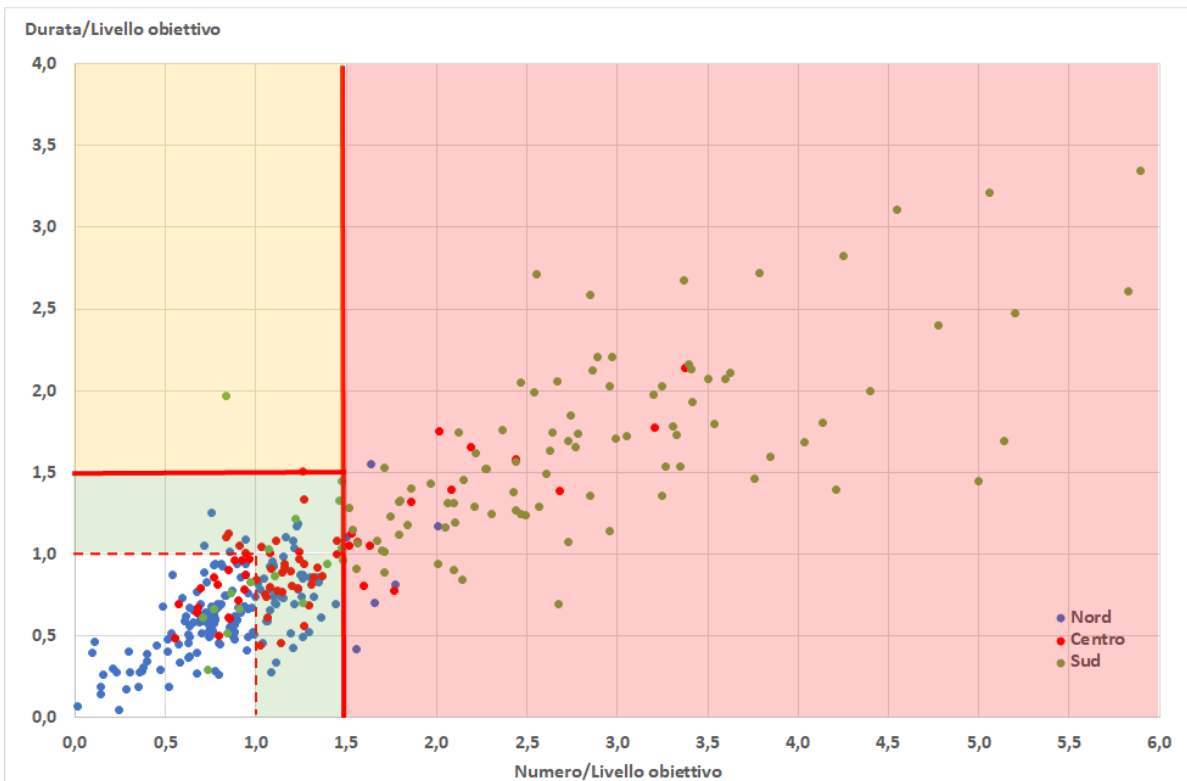
<p>What is the role of the NRA?</p>	<p>ARERA typically takes a proactive approach to Dynamic Regulation, in which it sets out the pilots or experiments to which market actors and/or network operators respond. In the case of a regulatory experiment, ARERA set out the criteria for the experiment being permissible, and is responsible for assessing DSOs' requests for (partial) exemption from the standard regulation to participate in the experiment.</p>
<p>How is DR enabled?</p>	<p>In general, ARERA's use of Dynamic Regulation approaches has not required a change to the legislation – initiatives supporting innovation have taken place under the ordinary legal powers deriving from Law 481/1995. The possibility of the regulatory experiment was introduced by ARERA under Article 27bis of the "output-based" regulation for DSOs for the period 2020-2023 (the article was introduced in a revision of the regulation that became effective on 1 January 2020, after a two-round consultation in 2019).</p> <p>Article 27bis sets out:</p> <ul style="list-style-type: none"> <li>• That DSO may request to participate in regulatory experiments with regard to the duration and number of unplanned interruptions of supply.</li> <li>• That participation in the regulatory experiment means the standard quality of service incentive would not apply for the duration of the experiment.</li> <li>• The timetable for submitting an application and ARERA's decision for experiments starting in either 2020 or 2021.</li> <li>• That all experiments must be completed by 2023 and that ARERA may take decisions after two years of experimentation for the purpose of large-scale extension of some exemptions granted.</li> <li>• That performance under the regulatory experiment would be assessed in the target year, and that interim targets (as in the standard incentive) would be suspended.</li> </ul>



<p>Who are the other key stakeholders?</p>	<p>In general, ARERA develops its Dynamic Regulation approaches through extensive engagement and through relationships with universities and research institutes (e.g. <i>Ricerca sul Sistema Energetico</i> – RSE). These organisations also support ARERA with ongoing monitoring of initiatives.</p>
<p>What does the DR seek to achieve?</p>	<p>ARERA sought to address deteriorating network reliability, which had been observed during the period of 2016-2019 after 15 years of continuous improvements in reliability. It seeks to do so by:</p> <ul style="list-style-type: none"> <li>targeting the “critical” areas of the network with the worst reliability performance; and</li> <li>incentivising the usage of innovative approaches to managing the distribution network.</li> </ul> <p>DSOs can propose an alternative path for improving reliability indicators over the regulatory period,<sup>52</sup> as long as the last year’s target is no worse than would have been under the standard incentive and provided that a new technology is to be trialled; further, the DSO may ask for derogation of any parameter or mechanism of ordinary incentive regulation for reliability. During the regulatory period no rewards or bonuses are applied relative to the alternative path – this creates an incentive for the DSO to innovate by removing the risk that under-performance in the short-term would result in a penalty.</p> <p>Performance against the target is only assessed in the final year of the regulatory period. Failure to meet the target results in the same penalty as would have applied under the standard incentive. Outperformance of the target results in a reward (calculated according to the alternative path proposed by DSO), up to the level that would have been achieved under the standard incentive.</p>
<p>Process for applying the DR</p>	<p>Derogations related to regulatory experiments are made as part of the tariff-and-quality setting process for each regulatory period. DSOs can apply for the experiment only in critical areas of their networks – defined as the area marked in red in the figure below, where the axes reflect deviation in performance for SAIDI and SAIFI-MAIFI, normalised with the “reference level” (<i>livello obiettivo</i>) that is differentiated according to territorial density.</p> <p>Principles used by ARERA for granting the exemption include:</p> <ul style="list-style-type: none"> <li>no infringement of the consumer protection; and</li> <li>no discrimination between network users.</li> </ul>

<sup>52</sup> The incentive uses the following reliability indicators: System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Momentary Average Interruption Frequency Index (MAIFI).

Once exempt, the DSO is required to reporting its results. ARERA would then disseminate the results and identify lessons for future regulatory periods according to the real effectiveness of solutions trialed as well as derogations temporarily approved.



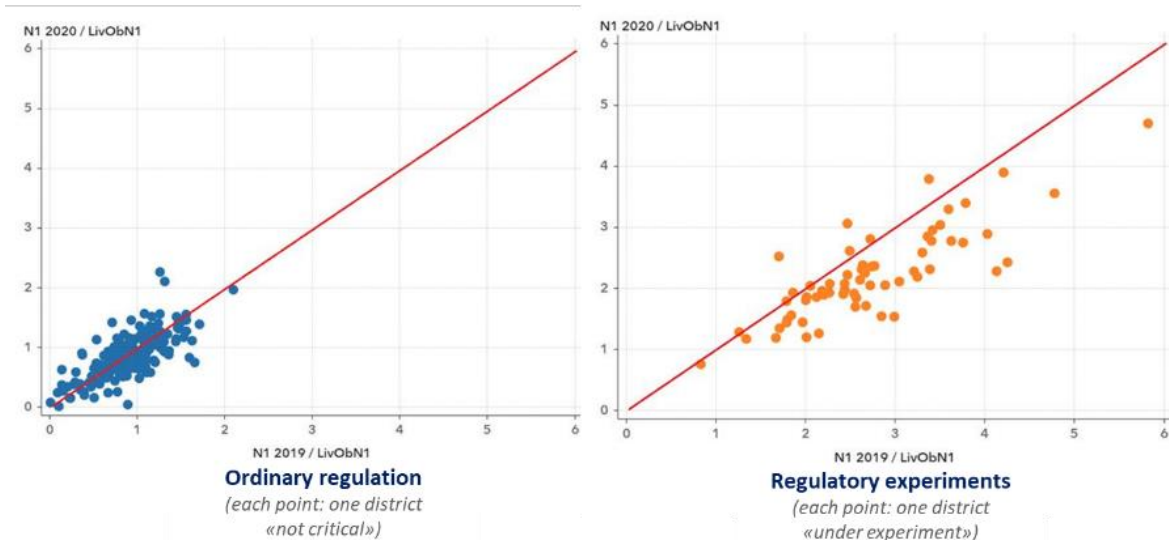
Scope of activities

The regulatory experiments are a tool available only to DSOs so far and only in areas of the network that are identified as 'critical' from a reliability perspective. While the DSOs may request exemptions from any aspect of the quality of service (reliability) incentive, so far requests have focused on:

- Using a less stringent measure of MAIFI – calculated for short interruptions lasting more than five seconds (instead of one second in the standard incentive).
- Yearly targets on a less stringent path than under the standard incentive.
- Euro/kWh not-served lower than in the standard incentive (used for both penalties and rewards).

Status	<p>In the 2020-2023 regulatory period, the regulatory experiment has been taken up by the two largest DSOs; each of them identifies critical zones where to trial its own experiment. Overall, the experiments cover approximately a quarter of total network users (9.6 million out of 37 million) in 63 out of 330 areas used for reliability incentives (<i>ambiti territoriali</i>).</p>
Impact	
What results have been observed?	<p>The regulatory experiment has proved particularly popular with the largest DSOs. A key impact attributed to the experiment is a change in participating DSOs' approach to network planning from a focus on traditional 'master plans' and capital reinforcement to an approach that is risk-based and better focused on the outcomes being delivered – specifically:</p> <ul style="list-style-type: none"> <li>• identifying system needs in terms of quality of service</li> <li>• developing advanced methodologies of risk evaluations to define the right priorities and the most effective interventions</li> <li>• evaluating the most effective interventions</li> <li>• exploiting technological innovation to reach the quality goals, with emphasis on modular and scalable interventions</li> <li>• extension of the observability, controllability and automation to the low voltage grid</li> <li>• identifying opportunities to harmonise investments to meet multiple objective and maximise the benefit/cost ratio</li> <li>• implementing structured processes for efficient asset management.</li> </ul> <p>A stakeholder noted that the aims and scope of the regulatory experiment were made very clear by ARERA, including the rationale for offering an alternative to the standard incentive. It was also noted that ARERA reviewed participating DSOs' preliminary proposals under the regulatory experiment, after which ARERA and each participating DSO exchanged their views. This helped the DSO ensure that its submission was acceptable, and accelerated the approval process.</p>
Consumer impacts	<p>It is too early to determine how successful the experiment has been in achieving better improvements in reliability than would otherwise be the case. However, evidence from the first year of the experiment – 2020 – shows improvement in the reliability indicators for nearly all of the areas in which the experiment applies.<sup>53</sup> This is illustrated in the figure below:</p>

<sup>53</sup> There may be a degree of annual variability in the indicators, for example as a result of extreme weather events not fully cleansed by existing mechanisms.



Source: provided by ARERA

<b>Other impacts</b>	Based on its experience to date with pilot regulations and regulatory experiments, ARERA has committed to continuing to use Dynamic Regulation tools to support the decarbonisation of the Italian energy sector. ARERA's strategy for 2022-2025 proposes to extend the use of such tools to green gas (following consultations № 39/2020 and № 250/2021, a decision is expected early 2022).
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**Lessons:**

<b>Strengths</b>	<p>A key strength of the experiment is that it is targeted at the areas of the network that would benefit the most from improved reliability. Moreover, the existence of a financial incentive at the end of the regulatory period rather than in every year, appears to be effective in incentivising more innovation on behalf of the DSOs to address local reliability issues.</p> <p>Additionally, by placing the onus on participating DSOs to identify an improvement path, the regulatory experiment generates ownership and responsibility by these DSOs.</p>
<b>Challenges</b>	<p>The main limitation of the regulatory experiment approach relates to its application to an incentive that pertains to the standard tariff-and-quality regulation for infrastructures. The mechanism is specifically aimed at incentivising the DSO to find a solution on its network. Solutions that would achieve the right balance of reliability and cost for consumers outside of network management are implicitly embedded in the output-based regulation and do not form part of this experiment. ARERA has adopted other Dynamic Regulation approaches when the objective has been to seek innovative solutions from market participants more broadly.</p>

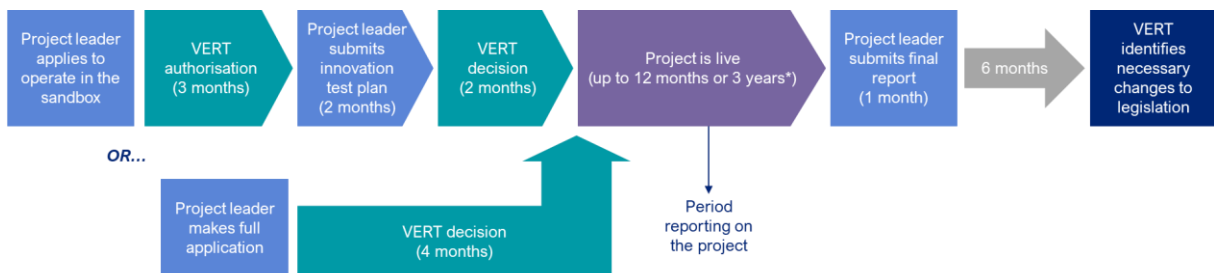
Conditions for success	Since this form of Dynamic Regulation is driven by the NRA identifying a need – in this case deteriorating reliability on the network – the primary requirement for success is that the NRA is able to identify and clearly articulate the outcome that the experiment seeks to achieve.
List of interviewees	Luca Lo Schiavo, Deputy Director, Energy Infrastructure and Unbundling Department, ARERA Riccardo Vailati, Officer, ARERA Ercolo De Luca, Head of Electrical System Development, areti S.p.a.
Bibliography	<p>ARERA (2020), <i>Testo Integrato della Regolazione Output-Based dei Servizi di Distribuzione e Misura dell'Energia Elettrica, Periodo di regolazione 2016-2023 in vigore dal 1° gennaio 2020, Articolo 27bis Esperimenti regolatori</i>. Accessed at: <a href="http://www.arera.it/allegati/docs/15/646-15alla_tiqe.pdf">www.arera.it/allegati/docs/15/646-15alla_tiqe.pdf</a></p> <p>ARERA (2021), <i>Quadro Strategico 2022-2025 dell'Autorità di Regolazione per Energia Reti e Ambiente, Documento per la consultazione</i>, 29 October 2021. Accessed at: <a href="https://www.arera.it/allegati/docs/21/465-21.pdf">https://www.arera.it/allegati/docs/21/465-21.pdf</a></p> <p>ARERA (2021), Law n. 481 of November 14th 1995. Accessed on 2 February 2022 at: <a href="https://www.arera.it/it/inglese/about/legge_istitutiva.htm">https://www.arera.it/it/inglese/about/legge_istitutiva.htm</a></p> <p>Areti (2020), <i>Esperimento Regolatorio sulla Qualità del Servizio</i>. Accessed at: <a href="http://www.arera.it/allegati/docs/20/020-20dieu_all.pdf">www.arera.it/allegati/docs/20/020-20dieu_all.pdf</a></p> <p>E-Distribuzione (2020), <i>Relazione tecnica per il posticipo dell'anno target e l'adesione agli esperimenti regolatori</i>. Accessed at: <a href="http://www.arera.it/allegati/docs/20/021-20dieu_all.pdf">www.arera.it/allegati/docs/20/021-20dieu_all.pdf</a></p> <p>International Smart Grids Action Network (2019), <i>Innovative Regulatory Approaches with Focus on Experimental Sandboxes – Casebook</i>, May. Accessed at: <a href="https://www.iea-isgan.org/wp-content/uploads/2019/05/ISGAN_Casebook-on-Regulatory-Sandbox-A2-1.pdf">https://www.iea-isgan.org/wp-content/uploads/2019/05/ISGAN_Casebook-on-Regulatory-Sandbox-A2-1.pdf</a></p> <p>International Smart Grids Action Network (2021), <i>Innovative Regulatory Approaches with Focus on Experimental Sandboxes 2.0 – Casebook</i>, October. Accessed at: <a href="https://www.iea-isgan.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf">https://www.iea-isgan.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf</a></p> <p>Lo Schiavo, L. (2021) <i>The Regulatory Toolbox for Supporting Innovation, Experience of the Italian Regulatory Authority: Regulatory Experiments and Pilot regulations</i>, presentation at CEER Internal Workshop on Dynamic Regulation, 25.06.21. Accessed at: <a href="https://www.ceer.eu/documents/104400/7244045/Luca+Lo+Schiavo+-+CEER+Internal+Workshop.pdf/a346cbc0-ffbf-8b34-0112-4814d87d1ee0?version=1.0">https://www.ceer.eu/documents/104400/7244045/Luca+Lo+Schiavo+-+CEER+Internal+Workshop.pdf/a346cbc0-ffbf-8b34-0112-4814d87d1ee0?version=1.0</a></p>

LITHUANIA	Energy Innovation Pilot Environment (regulatory sandbox)				
Case Study Name	Energy innovation pilot environment In Lithuanian: <i>Bandomoji energetikos inovacijų aplinka</i>				
Key Features	<b>Degree of NRA involvement</b>	<b>Scope of activities</b>	<b>Type of participants involved</b>	<b>Primary aim</b>	<b>Funding</b>
	NRA as facilitator	Open to all activities in electricity, gas and district heating	Open to regulated and unregulated companies	Informing regulatory policy	Rewards available for successful projects
Description	<p>The National Energy Independence Strategy (2018) places emphasis on the role of innovation in energy policy, with an objective that Lithuania would become an exporter of energy technology. In order to facilitate and promote the development of energy innovation and technologies, an amendment was made to the Energy Law to introduce the possibility of using a pilot environment (regulatory sandbox) to test energy innovations.</p> <p>This enables innovators to carry out live testing of new products and business solutions, under the supervision of the National Energy Regulatory Council (VERT<sup>54</sup>). The sandbox seeks to address a barrier to innovation where previously testing innovations required a bespoke permit.</p> <p>Sandboxes are granted for 12 months for testing services and business models and for three years for testing technologies; they may be extended for a further 12 months at VERT's discretion.</p>				
<b>Implementation</b>					
What is the role of the NRA?	VERT is responsible for assessing applications and granting exemptions to operate within the sandbox. It is also responsible for monitoring projects that have been granted an exemption, and for identifying any changes to the legislation that should be made in light of successful sandbox projects.				
How is DR enabled?	<p>The Energy Law (2020) included 11 Acts related to supporting innovation, of which the sandbox was one. It is recognised that temporary and limited activities in a pilot environment, in particular with additional consumer and public interest measures, justify a more flexible interpretation of the legislation that better supports energy innovation.</p> <p>The amendments to the Energy Law establish the main principles and criteria for such regulatory sandbox and the rights and obligations of participants in this regulatory approach. The exceptions that could be applied to a specific innovation are:</p>				

<sup>54</sup> In Lithuanian: Valstybinė energetikos reguliavimo taryba.

	<ul style="list-style-type: none"> <li>• the opportunity to operate in a pilot environment without the required licenses, permits and/or certificates required for regulatory activities;</li> <li>• the possibility to change and apply the technical parameters set out in the legislation to other indicators that have the same impact on the operation of the energy system, as well as to reduce requirements and/or exemptions without compromising security of supply, reliability and quality requirements.</li> </ul> <p>The above exemptions are accompanied by a commitment from VERT not to impose sanctions on the project owner, unless necessary.</p>
<p>Who are the other key stakeholders?</p>	<p>In the process of assessing an application, VERT may engage with other state and/or municipal institutions, enterprises, bodies and organisations, and exchange information as necessary to inform its decision.</p>
<p>What does the DR seek to achieve?</p>	<p>The sandbox is designed to facilitate the implementation of energy innovations in the Lithuanian energy sector. It is specifically designed to deal with situations in which the current regulation is insufficient or unclear with regard to a specific innovation. Consultations around the creation of the sandbox highlighted the need to address the recovery of costs associated with innovation (both the timing between costs being incurred and their recovery, and the rate of return that applies to innovations).</p> <p>A related aim is to help VERT develop an understanding of the potential impact of energy innovations on consumers and the energy sector, helping to identify emerging risks and potential gaps in regulation. This would allow such risks and gaps to be addressed proactively.</p>
<p>Process for applying the DR</p>	<p>There are two key elements that each application must address: (1) meeting the eligibility criteria, and (2) the test plan for the innovation being trialled.</p> <p>VERT has set out the following <u>eligibility criteria</u>:</p> <ul style="list-style-type: none"> <li>• <b>Benefits:</b> the innovation could provide more useful and/or convenient services to consumers and/or energy companies. This includes cost savings.</li> <li>• <b>Necessity of testing:</b> testing energy innovation in a real environment is necessary for the implementation of the innovation.</li> <li>• <b>Applicability:</b> the innovation would be implemented in Lithuania. The technology or service/business model are relevant to the energy sectors regulated by VERT (electricity, gas and district heating).</li> <li>• <b>Novelty/substantial improvement:</b> the innovation is not yet considered a normal business practice and is not commonly used in other countries' markets and/or Lithuania. An innovation that is used in other countries but is new in Lithuania may still be eligible if it is not currently assessed by VERT in its normal tariff-setting process.</li> <li>• <b>Preparation:</b> the innovation is ready to be tested in a real environment; this means that a theoretical assessment of the</li> </ul>

	<p>applicability has been performed, the resources required are available, risks are identified and any other pre-requisites are known.</p> <ul style="list-style-type: none"> <li>• <b>Duration:</b> there must be clearly defined conditions for the end or extension of the project. If the project involves investment in fixed assets, there must be a management plan for these assets after the end of the trial.</li> </ul> <p>VERT has also specified what each innovation's <u>test plan</u> must include:</p> <ul style="list-style-type: none"> <li>• Detailed description of the innovation.</li> <li>• The activities to be carried out in the pilot environment.</li> <li>• Identification of the exemptions sought.</li> <li>• Information on the intended cooperation with other market participants in the energy sector, consultants, scientific institutions, partners of other countries and other entities.</li> <li>• The results sought in the pilot environment.</li> <li>• The test timelines, including for submission of interim results to VERT.</li> <li>• Description of the trial participants, how they will be recruited for the trial, and confirmation that they will be informed of their participation in the trial and the risks involved.</li> <li>• The main risks, planned mitigations, and process for handling customer complaints.</li> <li>• Measures to limit the scope of the test (e.g. maximum number of participants) and other measures to protect the interests of consumers and of society.</li> </ul> <p>A termination plan demonstrating compliance with energy legislation after trial, including where the innovation is no longer provided to customers after the trial. There are two paths available to applicants – a one-go full application or a two-part application involving an initial approval and then a final decision. These are illustrated in the figure below:</p>
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\* Exemptions may be renewed once for a further 12 months

Source: CEPA based on VERT (2020)



Scope of activities	The sandbox is available for activities in electricity, gas and district heating. While the sandbox can potentially be accessed by either regulated or unregulated companies, the current expectation is that the need for exemption is expected to be more valuable to regulated companies.
Status	At the time of this report's drafting, there have been no formal application for the sandbox and no live projects. VERT has held preliminary discussions with developers of projects related to batteries and smart grids, amongst others.
What results have been observed?	No results have been observed as yet. Prior to the launch of the sandbox, a trial was conducted for DSO-led rollout of smart meters. Following the trial, the DSO submitted a cost-benefit analysis to VERT and, subsequently, it has been granted the monopoly provision of smart meters.
Consumer impacts	No direct consumer impacts have been observed yet.
Other impacts	VERT has identified extensive stakeholder interest in the consultation process that led to the introduction of the sandbox. In light of stakeholder feedback and its own observations, VERT is currently engaging with the Ministry of Energy to request greater flexibility within the legislation, which would enable VERT to better respond to the rapidly changing energy environment.

### Lessons

Strengths	<p>The sandbox process establishes upfront the success criteria for each trial, and the implications of success once a trial is complete:</p> <ul style="list-style-type: none"> <li>• VERT would identify amendments to the regulations; proposed amendments to legislation; or make recommendations on how to support the innovation.</li> <li>• For projects by the DSO or TSO, the investment would be eligible for a 1% premium on the rate of return, for a period of five years.</li> </ul>
Challenges	<p>VERT staff have highlighted the risk that, rather than supporting true innovation, an exemption could be used to evade regulations in a way that creates a favourable situation for a market participant and may distort competition.</p> <p>VERT staff have also highlighted the difficulty in distinguishing between a first-of-a-kind innovation and "fast followers", and the question of whether the sandbox should be restricted to just the former or whether there benefits from making it available to fast followers.</p>

Conditions for success	The approach to the sandbox in Lithuania places great emphasis on “newness” or novelty of an innovation. This creates a challenge for the NRA to have suitable technical expertise that would allow it to understand the innovation, its impacts, and the risk involved. The more novel the innovation, the more difficult it may be to have the appropriate expertise.
List of interviewees	Giedrius Blagnys, Adviser, Electricity division, VERT Karolis Demšė, Adviser, Gas division, VERT Irma Zdanienė, Head, International Relations division, VERT Justina Alsytė-Gogelienė, Adviser, International Relations division, VERT Benas Skublickas, Chief specialist, International Relations division, VERT

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PORTUGAL	Pilot Projects
Case Study Name	Regulations enabling pilot projects In Portuguese: <i>Regras do Projeto Piloto</i>
Key Features	

	Degree of NRA involvement	Scope of activities	Type of participants involved	Primary aim	Funding
	NRA driving the process in response to stakeholder interest	Specific activities such as dynamic network tariffs and participation of consumers in the reserve market	Each pilot involves different participants. To date this has included the TSO, suppliers and energy communities	Informing regulatory policy	None provided
Description	<p>The possibility of pilot projects has been introduced with regard to specific activities in the energy sector that are deemed clearly innovative and important for the decarbonisation of the Portuguese energy system. This has largely been in the electricity sector, focusing on smart grids, dynamic tariffs, consumer participation in the reserve market, self-consumption (energy communities) and electromobility. However, the legislation was extended in 2021 to cover gas networks, with the aim of testing hydrogen injections.</p> <p>A more standardised framework for conducting pilot projects has been introduced since 2019, following the positive insights gained from previous pilots that were granted on an ad hoc basis. There is ambition to further standardise the selection criteria in order to improve clarity for project promoters.</p>				
<b>Implementation</b>					
What is the role of the NRA?	<p><i>Entidade Reguladora dos Serviços Energéticos</i> (ERSE) has three main functions with regard to the pilot projects:</p> <ul style="list-style-type: none"> <li>• First, it identifies the activities for which pilot projects should be permissible and amends the regulations accordingly. To do so, ERSE engages with the network operators, consumers and other energy stakeholders – for example, to identify barriers under the current tariff regulation regime.</li> <li>• Second, it assesses applications for pilot projects and decides whether they should be granted permission to run a trial.</li> </ul> <p>Third, it evaluates the pilot projects and decides whether permanent changes to the regulations are needed to reflect the lessons from those pilots.</p>				
How is DR enabled?	<p>The ability to make pilots permissible exists within ERSE's general regulatory discretion to amend the regulations that apply to electricity, gas, electromobility, and fuel and liquefied petroleum gas (LPG).</p> <p>The framework for enabling pilot projects consists of two stages: first, ERSE amends a regulation to make pilot projects permissible with regard to a certain activity (e.g. electromobility); second, ERSE approves applications for individual pilot projects on a case-by-case basis.</p> <p>Approved pilot projects can run for a period of one year.</p>				
Who are the other key stakeholders?	<p>Pilot projects can be proposed by any entity. To date, pilot projects have involved one or more of the following groups of stakeholders: suppliers, DSOs, energy communities.</p>				

<p>What does the DR seek to achieve?</p>	<p>The possibility of pilot projects has been introduced within the wider strategic context of ERSE's aims to decarbonise the Portuguese energy systems and, particularly, to align consumer participation with EU legislation. It is part of a broader set of measures, such as the move to total expenditure (totex) regulation of the network operators. The regulations regarding pilot projects place particular emphasis on technologies and activities that are deemed especially innovative. In doing so, they enable for the "centralisation" and socialisation of insights related to these innovations, in a way that is expected to facilitate the decarbonisation of the Portuguese economy. By trialling such innovations on a smaller scale, ERSE can have confidence that any consumer harms could be contained and lessons learned.</p> <p>One example is pilot projects related to self-consumption. Legislation (Decreto-Lei № 162/2019) already allows for advanced concepts related to self-consumption for the use of renewable energy, such as introducing the possibility of "collective self-consumption" based on the association of consumers and nearby production units, and managed by a Self-Consumption Management Entity that is responsible for the relationship with the network operator, for the purposes of managing energy sharing and making production data available, as well as for the relationship with the aggregator for the purpose of selling surpluses from collective self-consumption. Nonetheless, pilot projects have been proposed that seek new rules that would facilitate different models of energy communities than those envisaged by the legislation.</p>
<p>Process for applying the DR</p>	<p>The conditions for approving a pilot project application are as follows:</p> <ul style="list-style-type: none"> <li>• Any entity can make an application to ERSE.</li> <li>• The project must aim to test the technical and economic feasibility, and applicability of, innovative practices and technologies, including identifying changes to legislation/-regulations.</li> <li>• ERSE must make its decision public.</li> <li>• ERSE will monitor the project and results must be made public.</li> </ul> <p>Applications to ERSE are made by project promoters on a case-by-case basis. According to ERSE staff interviewed, one of the reasons for adopting the formalised structure of the pilot projects regulation is to provide promoters with a systematic and transparent approach to the approvals process.</p>
<p>Scope of activities</p>	<p>The possibility of conducting pilot projects has been introduced with regard to specific energy related activities. To date, ERSE has granted pilot projects specifically related to the following:</p> <ul style="list-style-type: none"> <li>• Dynamic network tariffs (<i>Diretiva</i> 6/2018)</li> <li>• Participation of consumers in the reserve market (<i>Diretiva</i> 4/2019)</li> </ul>

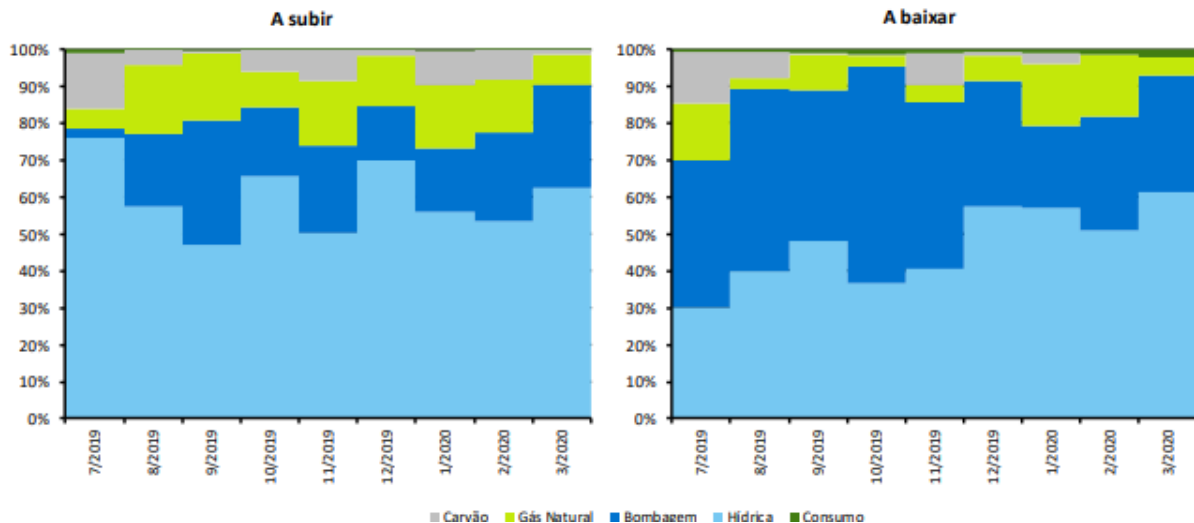
	<p>Moreover, ERSE has made pilot projects possible under the overall regulations that apply to the following activities:</p> <ul style="list-style-type: none"> <li>• Smart grids (Article 38 of <i>Regulamento</i> 610/2019)</li> <li>• Electric mobility (Article 95 of <i>Regulamento</i> 854/2019)</li> <li>• Self-consumption of energy (Article 55 of <i>Regulamento</i> 373/2021)</li> </ul> <p>Access to gas networks for green gases (Article 56 of <i>Regulamento</i> 407/2021)</p>
<p>Status</p>	<p>In 2019 ERSE authorised the TSO to enable the participation in the regulatory reserve market by consumers who have a supply capacity equal to or greater than 1 MW and are connected to the grid at a voltage level equal to or greater than medium voltage. Following an evaluation of the project in 2020, ERSE extended the permissions granted under the pilot project, and is undertaking to change the standard regulation.</p> <p>Three pilots have been approved for self-consumption. These projects are being put forward by energy communities (e.g. building blocks). One pilot is the 'Renewable Energy Community – Agra do Amial' in the city of Porto. This project covers a housing district and a school, and is aimed at social housing and combating energy poverty by testing the integration of storage, energy efficiency and charging solutions for electric vehicles.</p> <p>One small-scale pilot for electromobility has been approved and is live on the island of São Miguel in the Azores. This project involves cooperation between Nissan, Magnun Cap, Nuvve, Eletricidade dos Açores and the Azores Regional Directorate of Energy to test vehicle-to-grid (V2G) technology using 10 vehicles. A request to pilot hydrogen injections to the gas network has been submitted to ERSE and is currently being reviewed. The project developers initially requested funding for the pilot, which ERSE has rejected.</p>
<p>What results have been observed?</p>	<p>The main pilot project that has been completed and reported on to date relates to consumer participation in the regulatory reserve market. The process observed in the pilot is illustrated in the figure below:</p>



Source: CEPA based on ERSE (2020)

Applications to participate in the pilot were received from 28 consumer installations. Of these, 20 installations were in the preliminary qualification tests, all but one of which successfully completed the tests. Ultimately, six consumer facilities completed all of the enabling steps during 2019 and were authorised to start operation, with four more becoming authorised in 2020. During the period for which reporting is available (12 July 2019 to 31 March 2020), only four of the six authorised facilities submitted offers into the regulatory reserve market.

Participation of consumer facilities in the regulatory reserve market represented 0.2% of the total mobilised energy for frequency raising services and 1.2% of the total energy mobilised for frequency lowering services. This is illustrated in the figure below:



Source: REN

The pilot revealed a number of lessons that would need to be addressed in future. For example, stakeholders highlighted issues related to:

- The greater challenge for the DSO to manage its local network in light of aggregated offerings from consumers to the TSO
- The need to improve the qualification tests and operationalisation of communications between the consumer installations and TSO. It was noted that the qualification tests took up the vast majority of 2019 – as applications were received at the end of January but the first authorisations were not granted until December.
- The need to improve information flows and communication between actors, so as to avoid issues observed during the pilot such as delays in invoicing.

Consumer impacts	<p>During the period of July 2019 to March 2020, consumer facilities participating in the pilot project made up 21% of the total mobilisations for frequency raising services and 9% of the total mobilisations for frequency lowering services. ERSE observed that these results indicate that consumers are more willing to increase electricity consumption than to decrease consumption.</p> <p>As part of the evaluation of the pilot, consumer benefits for participants were estimated with regard to three aspects:</p> <ul style="list-style-type: none"> <li>• Energy mobilised in the regulatory reserve market, valued at the marginal price less the (avoided) cost of energy that would have needed to be purchased.</li> <li>• Avoided cost of losses.<sup>55</sup></li> <li>• Avoided network tariffs.</li> </ul> <p>The estimated benefits to participants were €401,000, of which 63% were attributed to avoided network tariffs and 34% were income from participation in the regulatory reserve market.</p>
Other impacts	<p>Partly as a result of the benefits observed from electricity pilot projects, and informed by advice from regulators including ERSE, the Portuguese government has introduced into law the concept of Free Zones for Technology. These are characterised as a “regulatory sandbox” in which certain geographical areas have been identified for testing innovations in certain sectors and technologies (e.g. self-driving cars, drones, etc.).</p>

#### Lessons

Strengths	<p>The first step in which ERSE makes pilot projects permissible with regard to a particular energy-related activity (1) ensures that the innovation under pilot projects is aligned with the strategic objectives for the Portuguese energy system, and (2) effectively acts as a “call to tender” for innovators to bring forward projects.</p> <p>The insights from pilot projects to date have been effective in providing comfort to ERSE (and other stakeholders) with regard to the regulations that need be changed to enable innovation; as well as where regulations should not be changed.</p>
Challenges	<p>ERSE staff have observed that each project application was very different to the others, meaning ERSE’s approval has to be made specific to the particulars of each project. The difficulty in agreeing a standardised definition of what a pilot project is means bespoke analysis needs to be developed for each new application.</p>

<sup>55</sup> This relates to the fact that pilot participants were paid without adjusting for network losses.

Conditions for success	To make the most effective use of the pilot projects, it is important that ERSE and stakeholders share a common understanding of what the regulation for pilot projects covers (and what it excludes). For example, promoters who expect to access funding through the pilots regulation are likely to find their efforts frustrated, potentially hampering the ability of the project to be actualised.
List of interviewees	Jorge Esteves, Director of Infrastructures and Networks, ERSE Inês Chaves, Manager, Financial and Economic Department, ERSE Filipe Matias Santos, Director of Legal, ERSE

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The NETHERLANDS	Energy Communities (regulatory sandbox)
Case Study Name	Energy experimentation law In Dutch: <i>Experimenten Elektriciteitswet</i>

Key Features	Degree of NRA involvement	Scope of activities	Type of participants involved	Primary aim	Funding
	Limited involvement by the NRA	Limited to energy community initiatives	Open to energy communities with a connection to the DSO	Enable market entry	None provided
Description	<p>The <i>Experimenten Elektriciteitswet</i> (EE) was a temporary law that allowed the testing of community energy projects. The EE aimed to make it easier for decentralised energy projects to be developed – with a key feature being an exemption from the unbundling requirement on supply and distribution – and, in turn, this would inform future legislative and regulatory changes.</p> <p>Exemptions under the EE were limited to two types of organisations: ‘<i>Coöperatie</i>’ (cooperative) and ‘<i>Vereniging van Eigenaars</i>’ (housing association). For simplicity, these are reflected as ‘energy communities’ in the rest of this case study.</p> <p>The EE ran from 2015 to 2018. In this period, 20 applications were made and 17 exemptions granted, of which five projects are live. Exemptions were typically granted for ten years.</p>				
What is the role of the NRA?	<p>ACM had a relatively limited role in the EE. Its primary function was to approve the tariff methodologies proposed by project developers once the project had received an exemption to operate within the EE. The EE was administered by the Netherlands Enterprise Agency (RVO). The ACM also had an informal role in answering any questions RVO might have in the assessment of exemption requests.</p>				
How is DR enabled?	<p>Article 7a of the Electricity Act 1998 makes it possible to deviate from the provisions of that Act for the purpose of experiments that contribute to “...developments in the field of production, transport and delivery of locally generated sustainable electricity, or electricity generated in an installation for cogeneration”.</p>				
Who are the other key stakeholders	<p>The EE was administered by the RVO. RVO was responsible for stakeholder communications, reviewing applications, and monitoring the progress of projects that received exemptions.</p> <p>A number of organisations supported applicants in developing their projects – for example, <i>Energie Samen</i> (Energy Together) and <i>Hier Opgewekt</i> (Raised Here).</p> <p>DSOs are involved to the extent that connections need to be agreed upon between the energy community and the distribution network. This often involved finding ways to minimise the connection capacity required (see section on ‘consumer impacts’).</p>				

<p>What does the DR seek to achieve?</p>	<p>The aim of the EE was to facilitate greater uptake of sustainable local energy, more efficient use of the available energy infrastructure, and greater involvement of electricity users in their energy supply. Moreover, lessons from projects under the EE would help identify necessary changes in energy legislation to support the energy transition.</p> <p>The overarching context for the EE is the Energy Agreements for Sustainable Growth – signed in 2013 between the Government and 40+ organisations – and, around the same time, the need to align domestic legislation with the EU's Third Energy Package. This was seen as an opportunity to streamline the regulation that applies to local energy.</p>
<p>Process for applying the DR</p>	<p>RVO operated an annual application window. Once granted an exemption by RVO, project developers needed to make a submission to the ACM for approval of tariff methodologies.</p>
<p>Scope of activities</p>	<p>Two types of projects are eligible for exemption:</p> <ul style="list-style-type: none"> <li>• 'Large' Experiments: covering up to 10,000 customers and involved both the energy community and the local DSO. The energy community could combine renewable electricity generation and retail, including setting their own tariffs. The DSO retained all responsibilities managing the network.</li> <li>• Project Network: a joint network of up to 500 customers with only one connection to the DSO. The energy community may combine generation, retail and management of the local electricity grid.</li> </ul> <p>Further requirements constrained the types of projects that could be eligible, for example:</p> <ul style="list-style-type: none"> <li>• A minimum of 80% of the participants being households, and the exclusion of large customers.</li> </ul> <p>The generation capacity must be limited to the final use of the participants – i.e. it could not be over-sized to enable export.</p>
<p>Status</p>	<p>RVO operated annual application cycles for each of the four years for which the EE was in place. Of the 20 applications made, only three were rejected while a further three were withdrawn. At present, five of the projects that were granted an exemption are operational.</p>

	<p>Following the expiry of the EE, the Ministry of Economic Affairs and Climate Policy developed new legislation that was intended to make exemptions available to all market players (e.g. suppliers, network operators, aggregators) in gas as well as in electricity. Rather than defining the scope for which exemptions would be permissible, the proposed law sought to leave it to the Minister to judge each application on its merits. This approach was rejected by Council of State, which highlighted the potential for the Minister's decisions to be inconsistent with EU law. The proposed law was withdrawn and has not been re-submitted. Although some elements from the withdrawn law have since been included in other proposed pieces of legislation, the Netherlands thus no longer has a regulatory sandbox scheme in place.</p>
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### Impacts

What results have been observed?	<p>Of the 17 applications that were initially approved by RVO, seven were for 'Project Networks' and ten were for 'Large' Experiments. All of the active projects currently are Project Networks.</p>
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Consumer impacts	<p>Congestion management is a growing issue in the Netherlands. Trials under the EE (for example, the Schoonschip and GridFlex projects) have shown that local flexibility behind the connection can facilitate a total connected capacity that far exceeds the transformer's rated capacity.</p> <p>The Schoonschip project consists of a private electricity grid with 30 connections, with each (boat) home equipped with a battery, smart heat pumps, heat storage tank and smart appliances. Smart grid software is used to manage households' flexible assets.</p> <p>More generally, interviewees have told us that the EE has given energy communities confidence that they could undertake these types of projects. There is a "trickle down" to communities that have not been involved in the projects, albeit the scale of involvement is still relatively small.</p>
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Other impacts	<p>There has been ongoing legislative reform since the EE expired. The Energiewet (Energy Law) is currently being consulted on. Amongst other things, the law would introduce an automatic exemption for small suppliers (less than 500 customers) – reflecting the lessons gained from the EE trials.</p> <p>The <i>Voortgang Energietransitie</i> (Progressing the Energy Transition Law) was introduced in 2018 and allows for more experiments by network operators. For example, ACM has granted exemptions such as for the development of a direct current network by the DSO Liander. This exemption was granted with the expectation that insights from this project, which has a five-year timeframe followed by a four-year evaluation period – would inform the need for more fundamental legislative changes to facilitate direct current networks.</p>
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	<p>Another impact has been the potential to reform network tariffs in light of lessons from the EE trials. Currently, two DSO-led working groups are exploring at tariff reform.</p>
Strengths	<p>Interviewees have told us they consider the EE to have been “very effective” at opening up the market for energy communities. In turn, this helped find new solutions for grid connections.</p> <p>Interviewees have also agreed that the EE has been effective in producing new insights and enabling knowledge sharing between different projects. While all projects relate to energy communities, there has been sufficient difference between each project to produce a rich source for learnings.</p>
Weaknesses	<p>Interviewees have highlighted the difficulty in making viable business cases for many of the projects:</p> <ul style="list-style-type: none"> <li>• Key to this was the absence of funding under the EE. Energy communities were not offered subsidies, nor was there an exemption from energy taxes. Furthermore, there were no favourable tariffs being offered – for example, to reflect the value of local flexibility.</li> <li>• Restrictions on who could participate in the trials also made it difficult to develop viable business cases. For example, the exclusion of DSOs from ‘Project Networks’ meant that energy communities had to take on the role of being the Balancing Responsible Party – introducing them to additional cash flow risk. And the exclusion of non-household customers meant there less access to flexible load.</li> </ul> <p>A further issue was that ACM’s review of the tariff methodology could only be conducted after RVO had granted an exemption to the project – restricting what ACM could do in such situations if a tariff methodology was deemed unsuitable. ACM sought to develop an memorandum of understanding with RVO to manage this interaction, but by then the EE had expired.</p>
Challenges	<p>The process of getting projects off the ground has proved time and resource consuming. This presents a particular challenge for energy communities, which are staffed by volunteers and not energy experts. Practical challenges to project have included, for example, delays in being granted planning permission.</p>

	<p>Initially there was some confusion amongst applicants and within RVO about the interpretation of certain clauses. For example, the EE was drafted to include the possibility of energy communities taking on the responsibility of system operation. But there was confusion about how this could be done in practice, given DSOs' responsibility for system operation. Ultimately it was decided that the scope of this exemption should be limited to congestion management via the energy community offering local flexibility. On other occasions some applicants found out during their application process that the scope of exemptions available was more limited than was expected.</p>
<p>Conditions for success</p>	<p><b>Communication.</b> RVO put in a lot of effort to explain the process to stakeholders and clarify its role. This included stakeholder meetings and updates on the RVO website. RVO held biannual stakeholder meetings to explain the EE, helping improve both stakeholders' and its own understanding of the law over time.</p>
<p>List of interviewees</p>	<p>Elise van Dijk, Legal Counsel, Energy Directorate, ACM Jeroen de Joode, Senior enforcement official, Energy Directorate, ACM Wido van Heemstra, formerly Manager of the Experimenteerregeling, RVO Job Swens, Consultant and Legal Adviser to the Schoonschip pilot</p>
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AUSTRALIA	New Reg Trial				
Case Study Name	New Reg Trial				
Key Features	<b>Degree of NRA involvement</b>	<b>Scope of activities</b>	<b>Type of participants involved</b>	<b>Primary aim</b>	<b>Funding</b>
	NRA as facilitator	Limited to the tariff-setting process	Open to electricity distribution network operators	Informing regulatory policy	None provided
Description	<p>In March 2018 the Australian Energy Regulator (AER), Energy Networks Australia, and Energy Consumers Australia set out a new regulatory approach to be trialled. The main principle of the process was the opportunity for a network business to reach agreement with its consumers that its tariff submission to the AER, or elements of it, reflects consumer preferences. This was done by introducing a counterparty, called the Customer Forum, which represents the interests of consumers and reflects this in their negotiations with the network on the revenue proposal. AusNet Services elected to trial the process during the 2022-26 Electricity Distribution Price Review.</p> <p>While the New Reg trial was undertaken by an electricity network, the AER highlighted that the approach used was transferrable to gas networks and would encourage similar trials with gas.</p>				

#### Implementation

What is the role of the NRA?	<p>Before a tariff proposal is submitted to the AER, the Customer Forum and the network business negotiate to reach agreement that the proposal reflects consumer preferences. The scope of negotiation is defined by agreement between the network, the Customer Forum and the AER. The AER provides technical and economic support to the Customer Forum during negotiations.</p> <p>After the negotiations conclude and the network business' proposal is submitted, the AER then undertakes its formal assessment of the proposal. The AER approaches the review as it would for standard price review, in accordance with the requirements and objectives that are set out in the National Electricity Rules (NER) and National Electricity Law (NEL).</p>
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<p>How is DR enabled?</p>	<p>The New Reg trial was conducted within the framework of the existing NER and NEL. However, an aim of the project was that the experience of the trial would inform the need for potential future change proposals to the NER.<sup>56</sup></p> <p>The departures from the previous regulatory practice include:</p> <ul style="list-style-type: none"> <li>• Counterparty – the network’s revenue proposal presented to the AER will have been developed and agreed (as far as possible) with the Customer Forum.</li> <li>• Regulator involvement – the previous process had no ‘buy in’ from the regulator on the outcome. In the New Reg, the regulator can be involved early and assist the network and consumers to reach an agreement, to which the AER can have regard to when considering the network business’ tariff proposal.</li> </ul> <p><b>Reaching agreement</b> – the core outcome is the extent to which the Customer Forum agrees to the network’s tariff proposal. The extent of that agreement (or disagreement) needs to be formally reported to the AER (and all other stakeholders) together with the basis for reaching that agreement.</p>
<p>Who are the other key stakeholders</p>	<p>The participating network business and its Customer Forum.</p>
<p>What does the DR seek to achieve?</p>	<p>The tariff setting process in Australia has typically been characterised by acrimony between the AER and the energy network companies, with AER decisions frequently appealed to a tribunal. In 2016, the network companies from the state of New South Wales won an appeal against the AER’s determination, but the AER challenged the tribunal’s decision at the Federal Court. This led to a series of interventions aimed at transforming the nature of tariff setting and moving towards a more collaborative approach between the AER and network companies. The New Reg initiative was developed by the AER jointly with network and consumer representatives as a way of trialling a more collaborative approach to tariff setting that could inform potential changes to the NEL and/or NER.</p> <p>The overall vision of the project was that energy consumers’ priorities should influence the tariff proposals made by energy network companies, as well as the outcomes from the regulatory price review process.</p> <p>In the Memorandum of Understanding agreed between the AER, AusNet Services and the Customer Forum, three overall objectives of the trial were agreed. These included:</p> <ul style="list-style-type: none"> <li>• Improve the speed and reduce the cost of the regulatory review process</li> </ul>

<sup>56</sup> Such change proposals may also be applicable to the National Gas Rules.



	<ul style="list-style-type: none"> <li>Enhance consumer confidence in the regulatory review process</li> <li>Improve the overall outcomes of the regulatory review process with a view to promoting the long-term interests of consumers of electricity</li> </ul>
<p>Process for applying the DR</p>	<p>The New Reg has two main stages:</p> <ul style="list-style-type: none"> <li>Early Engagement Process – the Customer Forum and the network business will seek to agree all or part of the tariff proposal, with support from the AER staff.</li> <li>Regulatory review process – the AER will assess the network business' tariff proposal in line with the requirements of the prevailing legislative and regulatory framework, having regard to the outcomes of the Early Engagement Process.</li> </ul> <p>The scope of matters to be considered in the proposal and Early Engagement process must be agreed between the business and the Customer Forum and accepted by the AER.</p>
<p>Scope of activities</p>	<p>The New Reg trial only applies to the regulated activities of the network business(es) that participate in the trial. Further, only a subset of matters are within the scope of negotiations between the network business and the Customer Forum. The remaining matters are determined by the AER in accordance with the standard price review process.</p> <p>For the AusNet Services trial of New Reg, the negotiations included:</p> <ul style="list-style-type: none"> <li>Operating expenditure (opex)</li> <li>Major augmentation (augex) projects</li> <li>Major replacement (repex) projects</li> <li>Expenditure to integrate distributed energy resources</li> <li>Innovation expenditure</li> <li>Smart metering</li> <li>Profile of revenue path</li> <li>Customer experience</li> <li>Customer hardship arrangements.</li> <li>Overall 'reasonableness' of the proposal.</li> </ul> <p>The following parts of the price review were not part of the negotiations:</p> <ul style="list-style-type: none"> <li>The allowed rate of return.</li> <li>All other capital expenditure (capex).</li> <li>Tax allowance.</li> <li>The opening value of the regulatory asset base (RAB) pricing structures.</li> </ul>
<p>Status</p>	<p>To date, the process has only been trialled with AusNet Services.</p>

Impact

<p>What results have been observed?</p>	<p>CEPA undertook an evaluation of the AusNet Services New Reg trial against its objectives. This analysis used evidence from primary documents, three trial Monitoring Reports produced by an independent monitor, and CEPA's interviews with the trial participants. CEPA found the following <b>process outcomes</b> from the AusNet Services trial:</p> <ul style="list-style-type: none"> <li>• The AER was able to place some weight on the outcomes of the Early Engagement Process, resulting in a more efficient review process.</li> <li>• The AER staff also reported that less resources were dedicated to the assessment of AusNet Services' proposal, relative to the standard price review process. However, AER resources were also used to support the negotiations and it was unclear whether the overall level of AER resourcing was more or less than if the standard process had been followed.</li> </ul> <p>AusNet Services reported higher net costs relative to previous review processes. However, AusNet Services stated that, even if they had not participated in the New Reg trial, it would have expected higher costs than in past regulatory reviews, reflecting the greater emphasis across the industry on customer engagement (no estimation has been made of the costs of undertaking an alternative process).</p>
<p>Consumer impacts</p>	<p>CEPA reported that the submissions received on AusNet Services' tariff proposal and the AER's Draft Decision indicate that the Early Engagement Process has generally helped to enhance consumer confidence in the regulatory review process. Stakeholder submissions demonstrated confidence that many of the positions agreed by AusNet Services and the Customer Forum were in the long-term interest of consumers.</p> <p>However, some stakeholder submissions raised concerns over aspects of the trial. These included whether the Customer Forum was in a position to assess the overall reasonableness of AusNet Services' revenue proposal given the Forum's limited scope for negotiation. Another concern was in relation to the level of engagement with major commercial and industrial customers, vulnerable customers and culturally diverse customers.</p>
<p>Other impacts</p>	<p>The originators of the New Reg process – the AER, Energy Networks Australia, and Energy Consumer Australia – all agreed that that trial provided valuable insights.</p>

	<p>The Australian Energy Markets Commission, which makes the rules that govern the AER's price reviews, monitored insights from the New Reg trial as part of its broader review of the regulation of energy network businesses, although to date it has not made rule changes as a direct result of the New Reg trial. However, the AER has launched a consultation on a handbook for regulatory price reviews. The handbook includes some concepts that have been introduced as a result of lessons from the New Reg trial.</p> <p>For example, the AER is proposing to introduce a 'targeted review stream' as an alternative to its standard price review process. In the targeted review stream, the onus is on the network business to carry out "genuine open consumer engagement" on its proposals in the early stages of the review, with the AER supporting consumers. The handbook also sets out expectations for network businesses' engagement with consumers, including expectation that proposals submitted to the AER would clearly demonstrate the impact that consumer engagement has had on the proposal.</p>
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#### Lessons

<p>Strengths</p>	<p>A success of the trial was that the Customer Forum and AusNet Services were satisfied that the tariff proposal better reflected consumers' interests than would have been the case without the New Reg trial. A number of factors were involved in achieving that level of satisfaction:</p> <ul style="list-style-type: none"> <li>• <b>The AER's role in the Early Engagement process.</b> Enabling difficult elements of the price review to be discussed early on, and to have input from the AER into those discussions supported the Customer Forum to act as a credible and independent counterparty to the network business. It also assisted the parties in reaching agreed positions that were, in the main, capable of acceptance under the NER.</li> <li>• <b>The ability of a Customer Forum to independently shape the content of the negotiation process,</b> which was an important factor in allowing the Customer Forum to highlight issues related to customer service.</li> <li>• <b>The preparation of an independent Engagement Report by the Customer Forum,</b> which appears to have assisted the AER in understanding how agreed negotiation positions were supported by evidence from customer engagement.</li> <li>• Furthermore, the trial revealed a number of <b>limitations of the rules that govern the price reviews</b> – such as a 'blind spot' in relation to service standards and other outcomes that customers would like their network business to deliver. The insights gained from the trial have been used by the AER to revise its guidebook for price reviews, and can be used to inform changes to the rules.</li> </ul>
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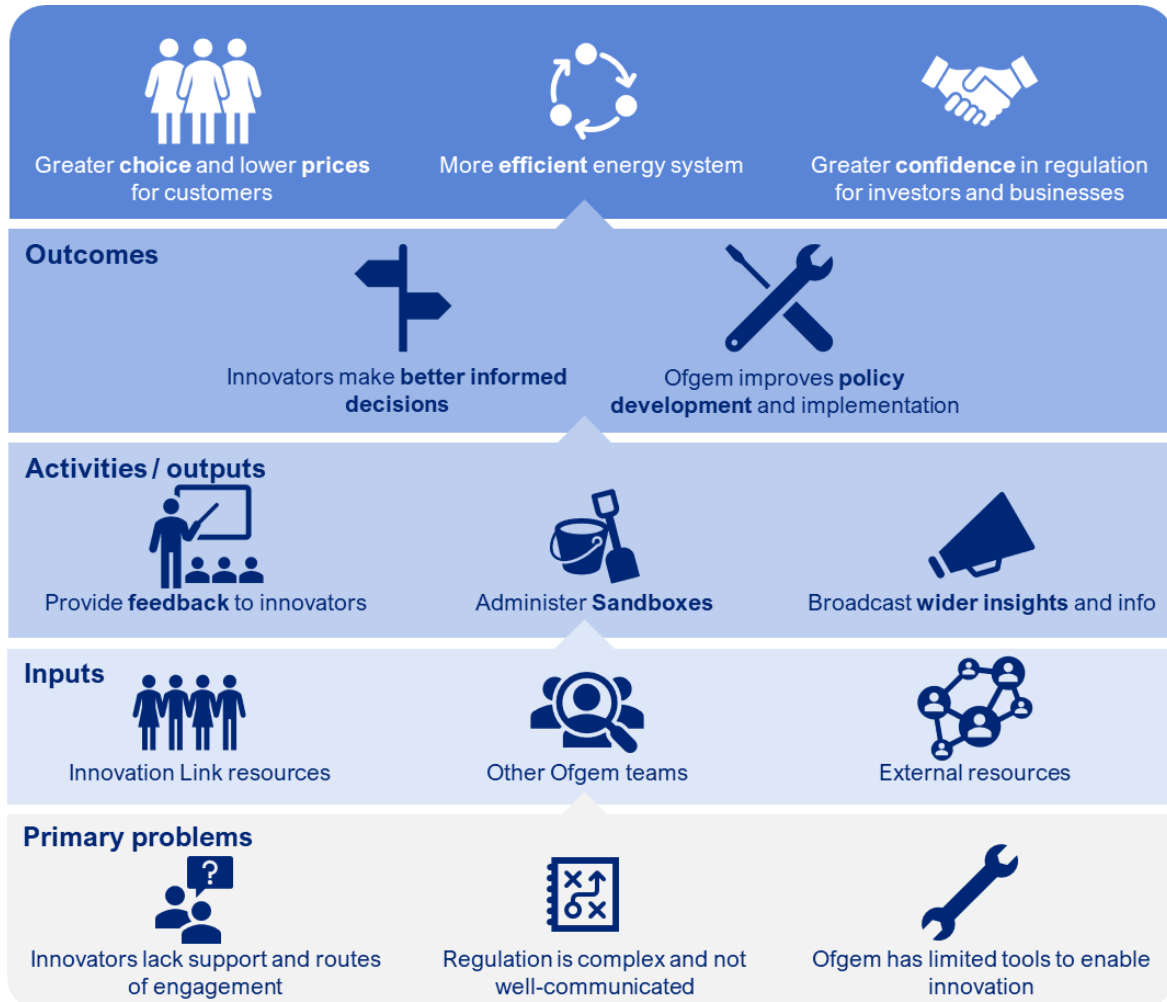
<p>Challenges</p>	<p>As the New Reg process operates within the current rules, these can constrain the AER's decision making. For example, based on its interpretation of the NER, the AER was not able to adopt the revenue path agreed in the Early Engagement Process. The AER may have formed a different view on whether the negotiated revenue path was in the long-term interest of consumers, had the NER provided it with the freedom to do so.</p> <p>The scope of the negotiations was limited. The Customer Forum did not consider all aspects of the tariff proposal in detail. This meant that, even under a different rules framework, the AER still would have needed to consider out-of-scope topics in detail. This may hinder the objective that the New Reg would reduce the cost of the regulatory review process. On the other hand, not all topics may be well suited to negotiation with a Customer Forum and a broader scope could also require more support from AER staff in the negotiation phase.</p> <p>The New Reg approach relies on the ability of the Customer Forum to act as a counterparty in the negotiations with the network business. However, some of the elements of the price review that have the largest impact on the revenue allowance – and on charges paid by consumers – are highly technical in nature (e.g. cost benchmarking, the rate of return). Members of the Forum may not have the technical expertise to negotiate on these matters, meaning the outcome relies on the AER's assessment. In the case of the AusNet service trial, the Customer Forum was not able to form a view on AusNet Services' proposals in relation to base year opex and cyber security opex, and referred those matters to the AER for a decision. The rate of return was not within scope of negotiations.</p>
<p>Conditions for success</p>	<ul style="list-style-type: none"> <li>• The success of the New Reg process depends on the extent to which both the network business and Customer Forum expect that the AER's decision-making will put significant weight on the outcomes of the negotiation. This expectation creates an important incentive for the network business and Customer Forum to reach agreements, and gives the Customer Forum leverage in negotiations.</li> <li>• Changes to improve communication may assist in addressing stakeholder concerns that the Customer Forum had a non-representative nature. For example, formalising requirements for the Customer Forum to regularly report and update to demonstrate accountability to consumer groups.</li> <li>• Early engagement on challenging issues that are likely to require multiple iterations of discussion before the Customer Forum and network business come to agreement.</li> </ul>

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GREAT BRITAIN	Ofgem's Innovation Link (regulatory sandbox)
Case Study Name	Ofgem's Innovation Link (regulatory sandbox)
Key Features	

	Degree of NRA involvement	Scope of activities	Type of participants involved	Primary aim	Funding
	NRA as facilitator	Open to all energy activities under Ofgem's remit	Energy licensees or those in partnership with a licensee	Enable market entry	None provided
<b>Description</b>	<p>The sandbox can help innovators trial and bring to market new products, services and business models, that cannot currently operate under existing market regulations. These trials run for a set period of time, normally up to two years, with a limited number of customers. Ofgem's Innovation Link was first created in 2016 and has been developed since then. The first sandbox had two application windows in 2017, followed by a publication by Ofgem of lessons learned and informed changes to the Sandbox in 2020. These changes included an on-demand service and an expansion of the types of support on offer.</p> <p>So far, innovators are mostly seeking opportunities in the retail electricity market, whilst some applicants target networks and microgrids. The scope of the sandbox is available to all activities that interact with regulated energy markets. There is no funding provided by Ofgem.</p>				
<b>Implementation</b>					
<b>What is the role of the NRA?</b>	<p>Ofgem's Innovation Link assesses and approves requests for sandboxes from innovators, working with the Code Administrators where derogation requests relate to industry codes.</p> <p>Depending on the sandbox tool, Ofgem provides bespoke guidance to innovators on interpreting or complying with regulation, assurance on how Ofgem might enforce particular regulatory requirements, or provisions for the innovator to comply with whilst in receipt of a sandbox.</p> <p>Ofgem is clear that a sandbox is not an endorsement from Ofgem for a specific business model, product or service.</p>				
<b>How is DR enabled?</b>	<p>There are four tools on offer from Ofgem's Innovation Link: 1.) the provision of bespoke guidance on what rules would mean in their specific trial circumstance; 2.) provision of comfort about what Ofgem considers to be compliant behaviour and their approach to enforcement; 3.) confirmation that a particular activity is permissible; and 4.) derogations. Ofgem classifies all four tools as constituting a regulatory sandbox, and applications for each of these tools go through the same process.</p> <p>Innovators must report back on the progress of their innovation, and monitor and report on their compliance performance during the sandbox period. Where appropriate, Ofgem may ask innovators to conduct a fuller evaluation of their sandbox activities.</p>				

	<p>In most cases, innovators wanting to run a trial using a sandbox either have to be an energy licensee (i.e. have previously been granted a licence by Ofgem), work with a licensee or be a party to industry codes that allow for them to participate in the live system. Innovators wanting to deliver a new product or service are either licensed, exempted from the requirement to hold a license or are undertaking activities that do not require a licence.</p> <p>The sandbox can change rules controlled by Ofgem (usually in licences), or in some cases from the rulebooks owned by the industry, which involve day-to-day operations of the system. The latter involves the respective Code Administrator(s).</p>
<p>Who are the other key stakeholders</p>	<p>Code Administrators may be involved in assessing, granting and monitoring a sandbox.</p> <p>To date, sandboxes have been granted to organisations ranging from suppliers, energy service companies, to network companies and microgrid operators.</p>
<p>What does the DR seek to achieve?</p>	<p>Ofgem uses sandboxes to enable greater experimentation, testing, and trialling to stimulate innovation under regulatory supervision. The innovation or new product must have the potential to benefit current and future consumers.</p> <p>Ofgem approve sandboxes that they consider have the potential for positive outcomes and desirable innovation features. These could include:</p> <ul style="list-style-type: none"> <li>• <b>Decarbonisation</b> – to go beyond business-as-usual decarbonisation and maximise net-zero potential of activities in the sector.</li> <li>• <b>Value creation</b> – avoid creating, or reduce system costs, or create new value without relying on passing costs to other system participants or customers.</li> <li>• <b>Inclusivity</b> – innovations which are inclusive and allow different types of consumer (including those in vulnerable situations) to participate in and benefit from a smart, flexible, energy system.</li> <li>• <b>Good network citizenship</b> – recognise the crucial role of energy networks and do not seek to avoid paying their fair share of costs.</li> <li>• <b>Competition and effectiveness</b> – deliver new products that drive competition and / or enable greater effectiveness and efficiency</li> </ul> <p>More generally, the aims of Ofgem’s Innovation Link service are capture in the “theory of change” diagram illustrated below:</p>



Source: CEPA (2021) based on Ofgem's Theory of Change for the Innovation Link

<p>Process for applying the DR</p>	<p>Ofgem has moved on from the sandbox application windows and now uses an 'on-demand' service so that innovators can apply as they need. Ofgem assess applications against a number of eligibility criteria, which include:</p> <ul style="list-style-type: none"> <li>• Innovative – is it a new product, service, business model or methodology that is not readily available in the market?</li> <li>• Consumer benefit – benefits could be higher standard of service, lower bills, increased efficiency or benefiting consumers' interests in net zero.</li> <li>• Need – there is a clear regulatory barrier that needs a response.</li> <li>• Support ability – the sandbox can deliver what the innovator needs.</li> <li>• Readiness – the innovator is ready to make use of sandbox support.</li> <li>• Exit strategy – the innovator must have a sandbox exit strategy. This may mean reverting to business as usual, accepting risks of</li> </ul>
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	<p>continuation or sponsoring a code modification leading to permanent change.</p> <ul style="list-style-type: none"> <li>Once sandboxes have been granted, participants are expected to fulfil monitoring and evaluation requirements. This facilitates learning from sandbox experience.</li> </ul>
<p>Scope of activities</p>	<p>Ofgem has not set out a limit on the activities that could be granted a sandbox. Instead, the limits are a function of Ofgem's own legislative scope – i.e. the energy sector activities to which Ofgem provides licenses.</p> <p>Examples of sandboxes that have been granted include: peer-to-peer electricity trading platforms, a new price-discovery methodology for facilitating investment in on-street EV charge point infrastructure, and a new industry methodology to facilitate the supplier switching process on microgrids.</p>
<p>Status</p>	<p>The sandbox service is active and ongoing. In the first two sandbox windows in 2017, there were 67 applications, seven sandboxes granted and three proceeded to trial. A further three have been granted sandbox since 2020.</p>
<p>What results have been observed?</p>	<p>From February to April 2021, CEPA interviewed two of the organisations that had been granted a sandbox during the first two application windows, and which have proceeded to trial. The benefits attributed by those organisations to the sandbox include:</p> <ul style="list-style-type: none"> <li>The ability to trial an approach to billing that would not have been possible without a sandbox allowed the innovator to gather additional customer insights on their innovation. This helped increase the innovator's understanding of the impact on customers from having a clearer billing structure. The innovator then incorporated additional changes to improve the customer experience and was better informed on how beneficial their innovation was. According to the innovator, the input and oversight from the Innovation Link and other Ofgem teams was of great help in enabling the innovation to be trialled in its most customer-friendly form.</li> </ul> <p>Engagement with Ofgem's Innovation Link in setting up the trial helped ensure that the trial put customers first. This led to internal conversations within the innovator's organisation, looking to answer questions such as "will customers understand this innovation?" and "how is this innovation in the interest of the customer?". The discussions with Ofgem and these internal conversations helped focus the innovator's proposition and led to a more customer-oriented trial design.</p>

Consumer impacts	Trials under the sandbox were at an early stage at the time CEPA conducted its interviews, so there was relatively little insight about the consumer impacts of the trials themselves. However, a consistent theme that emerged is that, in preparing for the trials, Ofgem's Innovation Link team stressed the need for the innovators to focus on the consumer impacts of their innovation. This, in turn, influenced some elements of how the innovators approached their trials.
Other impacts	<p>As a result of the first sandbox application window, Ofgem identified a number of lessons and has reformed its approach accordingly.</p> <p>For example, Ofgem introduced the 'Fast, Frank Feedback' (FFF) service to provide innovators with advice without requiring a sandbox application. CEPA's evaluation of the Innovation Link through interviews and an online survey of innovators who used the FFF service found that the service:</p> <ul style="list-style-type: none"> <li>• helped innovators to better understand their own innovations and how they can work within the market;</li> <li>• provided guidance regarding upcoming regulation, which innovators valued;</li> <li>• enabled innovators to have greater confidence in their proposals;</li> <li>• in some cases, was seen to provide a level of confidence in the innovations that made them more attractive to investors (though Innovation Link guidance does not represent an approval or endorsement of the innovation); and</li> <li>• helped ensure that innovation is focused on improving customer impacts.</li> </ul>
Strengths	<p>Ofgem's sandboxes can cover a broad scope of activities. In light of lessons from the first sandbox windows, it was recognised that innovators often needed relief from industry codes. In response, Elexon (for the BSC) and ElectraLink (for the DCUSA) have introduced sandbox derogation tools for electricity licence holders and some non-licensed electricity parties. This response increases the scope and range of tools that innovators can access by applying to the sandbox. Ofgem are looking to extend the number of rules in the supply licence that can be derogated from.</p> <ul style="list-style-type: none"> <li>• Ofgem's sandbox process is innovator-led, meaning that there is more scope for the market to propose innovations, rather than relying on the NRA identifying promising innovations. The most recent Ofgem sandbox uses an 'on-demand' service so that innovators can access the sandbox at time of need. This way, innovators are not forced to ask for support too soon, through fear of application window closing.</li> <li>• Ofgem offer a feedback service if innovators application is not sandbox-ready. Through CEPA's interview and surveys, it was</li> </ul>

	<p>recognised that respondents found Ofgem’s guidance about upcoming regulation a strongpoint.</p>
<p>Challenges</p>	<p>Impacting regulatory policy. The innovator-led approach means that there is limited strategic direction or coordination of sandboxes, which means that there is less opportunity to gain systematic insights compared to some of the other approaches reviewed. A report for the European Commission on barriers in the GB retail energy markets observed, in the context of the regulatory sandbox scheme, that “...fully incorporating novel models into regulation will require explicit plans and commitment, especially given the complexity of the British energy markets”.<sup>57</sup> A similar insight was obtained from CEPA’s evaluation of the Innovation Link.</p> <ul style="list-style-type: none"> <li>• <b>Reporting and monitoring.</b> Relative to some of the other sandboxes reviewed, the first two sandbox windows appeared to require less reporting on trials and less publication of insights from the trials. This may be a function of the innovator-led approach and an emphasis on commercial confidence.</li> <li>• <b>Coordination within the energy sector.</b> Some electricity Code Administrators have developed sandbox capabilities. However, similar provisions have not yet been developed for gas codes. A lack of coordination between different organisations in regulatory roles means that innovators can be faced with multiple regulatory barriers.</li> <li>• <b>Coordination outside the energy sector.</b> Increasingly, innovations to deliver decarbonisation straddle regulations beyond those administered by Ofgem. For instance, transport regulation affects innovators operating in the electrical vehicles space; building code regulations may affect the drive to decarbonise heat; and cooperative business models may require approval from the Financial Conduct Authority. Enabling such innovations may require derogations (e.g. sandbox approvals) from multiple regulators.</li> </ul>
<p>Conditions for success</p>	<p>Regulatory sandbox services must be visible to innovators, including those not currently active in the energy sector.</p> <ul style="list-style-type: none"> <li>• Clear guidance on what the sandbox can and cannot do, and the conditions under which a sandbox would be granted.</li> <li>• Coordination with the Code Administrators to enable the scope of some trials to be possible.</li> <li>• Implementing ongoing monitoring and evaluation tools to ensure lessons from sandboxes are captured by the NRA and, subject to commercial confidentiality, other stakeholders.</li> </ul>

<sup>57</sup> European Commission (2021) ‘European barriers in retail energy markets: Great Britain country handbook’

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## Annex 3 – Comparison of the Italian and French cases

Steps in enabling Dynamic Regulation projects	Italy – Regulatory experiment involving the DSO quality of service incentive	France – Regulatory Experimentation System
<b>Creation of the enabling legislation</b>	The regulatory experiment is made possible within the roles and responsibilities that are assigned to ARERA under Law 481/1995. Specifically, the regulatory experiment is made possible as part of ARERA's responsibility for setting electricity network tariffs.	The Regulatory Experimentation System was made possible under the Energy-Climate Law, which came into effect on 8 <sup>th</sup> November 2019.
<b>Setting up the Dynamic Regulation initiative</b>	The possibility of the regulatory experiment was introduced by ARERA under Article 27bis of the 'output-based' regulation for DSOs for the period 2020-2023. Article 27bis was introduced in a revision of the regulation that became effective on 1 <sup>st</sup> January 2020, following two rounds of consultation in 2019.	CRE launched a first consultation on how the Regulatory Experimentation System should work on 30 <sup>th</sup> January 2020, and confirmed its approach to the first application window in a deliberation note published on 4 <sup>th</sup> June 2020.
<b>Applications</b>	DSOs who wished to participate in the experiment from 2020 had to submit their proposal for the experiment by 30 <sup>th</sup> April 2020. DSO that wished to participate from 2021 had to submit their proposal by 28 <sup>th</sup> February 2021.	The first application window ran from June to September 2020 (3 months).
<b>Assessment</b>	ARERA conducted its assessment of the proposed experiments and made its decisions for 2020 applications by 31 <sup>st</sup> July 2020 (3 months after the submission deadline).	CRE conducted an initial assessment against the eligibility criteria and published its decision on which projects were eligible on 5 <sup>th</sup> November 2020 (approximately 1 month after the submission deadline).
<b>Decisions on awarding entry into Dynamic Regulation initiative</b>	Decisions on proposed experiments starting in 2021 was made by 30 <sup>th</sup> June 2021 (4 months after submission).	CRE awarded derogations for 9 of the 10 projects for which it was the competent authority (either solely or jointly with the Energy Ministry) on 11 March 2021 (approximately 3 months after the eligibility decision).
<b>Live project phase</b>	Experiments must be completed by 2023. No incentive reward or penalty applies until the conclusions of each experiment.	The law allows for exemptions for a maximum of 4 years that may be renewed once for a maximum for 4 more years.
<b>Project closeout and feedback into regulatory decision-making</b>	Participating DSOs are required to report its results to ARERA, which identify lessons for future regulatory periods according to the real effectiveness of solutions trialled, as well as derogations temporarily approved. ARERA may take decisions after two years of experimentation for the purpose of large-scale extension of some exemptions granted.	Project leaders must submit an annual progress report to CRE, as well as a report at the end of their experiment. Based on feedback and the results of the experimentation, CRE may propose regulatory or legislative changes to address any obstacles identified during the experiment and the observed benefits of the project. On 22 July 2021 CRE published its lessons from the first application window and launched the second application window.

*Table: Comparison of the Dynamic Regulation process for the Italian and French case studies*

Source: CEPA review of case studies

## **Annex 4 – About CEER**

The Council of European Energy Regulators (CEER) is the voice of Europe's national energy regulators. CEER's members and observers comprise 39 national energy regulatory authorities (NRAs) from across Europe.

CEER is legally established as a not-for-profit association under Belgian law, with a small Secretariat based in Brussels to assist the organisation.

CEER supports its NRA members/observers in their responsibilities, sharing experience and developing regulatory capacity and best practices. It does so by facilitating expert working group meetings, hosting workshops and events, supporting the development and publication of regulatory papers, and through an in-house Training Academy. Through CEER, European NRAs cooperate and develop common position papers, advice and forward-thinking recommendations to improve the electricity and gas markets for the benefit of consumers and businesses.

In terms of policy, CEER actively promotes an investment friendly, harmonised regulatory environment and the consistent application of existing EU legislation. A key objective of CEER is to facilitate the creation of a single, competitive, efficient and sustainable Internal Energy Market in Europe that works in the consumer interest.

Specifically, CEER deals with a range of energy regulatory issues including wholesale and retail markets; consumer issues; distribution networks; smart grids; flexibility; sustainability; and international cooperation.

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More information is available at [www.ceer.eu](http://www.ceer.eu).