



# Distributed renewable energy and the digital transformation of energy systems

Challenges and opportunities for Latin America

**30 May 2022**

**15:00 – 17:00 (Paris time)**

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# Agenda

15:00-15:05	<p><b>Opening Remarks</b></p> <ul style="list-style-type: none"> <li>Paolo Frankl, Head of the Renewable Energy Division, IEA</li> </ul>
15:05-15:20	<p><b>Setting the scene: Digitalisation as enabler for distributed renewable energy generation in Latin America</b></p> <ul style="list-style-type: none"> <li>Heymi Bahar, Senior Analyst, Renewable Energy Division - International Energy Agency (global and regional deployment trends)</li> <li>Pauline Henriot, Energy Analyst, Digitalization, Energy Efficiency Division, IEA (available tech solutions, potential benefits and risks)</li> <li>Enrique Gutierrez, Renewable Integration and Secure Electricity Unit, IEA (areas for action by governments – regulators –market design)</li> </ul>
15:20 – 16:05	<p><b>Panel 1: International experiences</b></p> <p>International experiences with using digital solutions to optimize distributed generation: case studies, lessons learned and future plans.</p> <p><b>Moderator:</b> Vida Rozite, Energy Policy Analyst, Energy Efficiency Division, IEA</p> <p>Panelists</p> <ul style="list-style-type: none"> <li>Daniel Mugnier, PVPVS Exco Chairman, TECSOL</li> <li>Walker Wright, Vice President - Public Policy, Sun Run, US</li> <li>Mena Testa, Head of Strategic Analysis, Enel Global Infrastructure &amp; Networks, Italy</li> <li>Matthias Galus, Head Digital Innovation Office, Swiss Federal Office of Energy</li> <li>Rita Mota, Chair of Retail Market Design Working Group, Eurelectric, Europe</li> </ul> <p>Q&amp;A, discussion</p>
16:05 – 16:55	<p><b>Panel 2: Practical challenges and opportunities in Latin America</b></p> <p>Discussing challenges and opportunities (market design, data and legal issues, financing, cybersecurity).</p> <p><b>Moderator:</b> Alejandro Hernandez, Regulatory Energy Transitions Accelerator, IEA</p> <p>Panelists</p> <ul style="list-style-type: none"> <li>Claudio Damiano, Renewable Energies and New Technologies Group, Ente Nacional Regulador de la Electricidad (ENRE), Argentina</li> <li>Livia Raggi, [-], Agência Nacional de Energia Elétrica (ANEEL), Brazil</li> <li>Jerson Reyes, Electric Department, Comisión Nacional de Energía (CNE), Chile</li> <li>Maria Claudia Alzate, Commissioner, Comisión de Regulación de Energía y Gas (CREG), Colombia</li> </ul> <p>Q&amp;A, discussion</p>
16:55 – 17:00	<p><b>Closing remarks and next steps</b></p> <ul style="list-style-type: none"> <li>Brian Motherway, Head of the Energy Efficiency Division, IEA</li> </ul>

## Background

Transitioning to a net zero energy system requires urgent and massive changes. In the IEA net-zero energy scenario (NZE), 630 GW of solar PV are added to the system yearly by 2030, four-times the record levels set in 2020, and 100 million buildings are equipped with residential PV by 2030 (from 25 million in 2020). This requires additional system flexibility to continuously balance electricity supply and demand and maintain grid stability, with more than 500 GW of demand response brought to market by 2030 in the NZE. At the same time investments need to nearly triple to an average of almost USD 800 billion by the late 2020s, with investments in digital assets must increase eightfold in the NZE.

Over the coming decades, digital technologies are set to make energy systems around the world more connected, efficient, reliable and sustainable, playing a key role in transforming distributed energy resources into valuable grid assets, with the right incentives. Digitalisation allows to identify the optimal placement of DER, make them visible to system operators, and allow to monitor and control them in real-time, supporting power system security and reliability, as well as the provision of flexibility.

Digitalised energy systems in the future may be able to identify who needs energy and deliver it at the right time, in the right place and at the lowest cost. By 2040, 1 billion households and 11 billion smart appliances worldwide could actively participate in interconnected electricity systems providing 185 GW of system flexibility, facilitating the integration of distributed energy resources.

Energy system digitalisation is gradually emerging around the globe with still a modest penetration in Latin America. Despite considerable deployment of distributed PV resources across countries, advanced meter infrastructure roll-out is still below 10% in the region, and time-of-use tariffs are being rolled-out at moderate pace. With distributed PV (DPV) set to expand in the coming years, accelerating the use of digitalised technologies in Latin America can optimize the deployment of distributed resources, enhancing systems' flexibility and boosting efficiency.

The complexity of the digital transformation of the energy system, raises issues around planning, financing and political economy (who benefits and who pays), technology and innovation, as well as cybersecurity. Governments have a role to set a conducive framework for this transformation, and realise the benefits while mitigating risks. This workshop will explore international experiences using digital solutions to optimize distributed generation and discuss next steps for Latin America.

## **From data to action: observability, controllability and regulatory frameworks**

Digital data and analytics can help achieve greater efficiencies through enhanced planning capacities, improved efficiency in power plants and lower loss rates in networks, as well as better project design throughout the overall power system. The decentralized nature of distributed resources poses challenges for systems operators to 1) know what is going on at the edge of their systems, 2) being able to ‘communicate’ with end-use appliances and 3) being authorized to manage data coming from DPV resources. In addition to the installation of smart infrastructure, this requires the establishment of formal regulatory frameworks to be able to collect and process data, to control end-use equipment and to set the terms of privacy protection and measures of cybersecurity.

## **Financing: who benefits and who pays?**

Limited access to financing and the question of ‘who pays’ for the deployment of digital solutions can hamper digitalisation efforts. The deployment of DER and digital technologies will require huge volumes of investments. These investments are also decentralized and often done by consumers, if public awareness for these technologies has been raised and incentives are right. Given the system-wide benefits from digitalising the energy system, a key question relates to who in the end pays for the infrastructure and who benefits. A balanced solution to the distribution of benefits can contribute to securing broad support to the roll-out of technologies and applications.

## **Market design and information flows: turning consumers into ‘prosumers’**

Digitalization allows small or medium sized energy users who generate energy with solar PV or wind energy and strategically exchange with the utility grid to meet their own demand or make profits from arbitrage, while controlling devices such as water heaters and electric vehicles charging to reduce their bill. However, the structures of current energy markets may not be suitable to accommodate these developments. In addition, the information infrastructures of current power systems are not designed to collect and handle the increasing information flows needed to enable the decision making and transactions of large amounts of distributed resources.

## **The event**

The aim is to provide both an international and regional perspective on optimising the deployment of distributed energy resources through digital solutions. Within this broader topic,



concrete challenges and opportunities confront policymakers and regulators in each particular region. Country-specific experiences which include, but are not limited to, market design, cybersecurity, data management and financing, merit a platform for exchange, which this event hopes to facilitate.

The IEA gratefully acknowledges the Italian Ministry for Ecological Transition for their support for this webinar as part of their contributions to IEA's [Digital Demand Driven Electricity Networks \(3DEN\) Initiative](#) on power system modernisation and effective utilisation of demand side resources through digitalisation and to the [Clean Energy Transitions Programme](#).

### Guiding questions

Panel 1 will focus on the following questions:

- **Identifying opportunities:** Where are immediate opportunities and benefits to promote the digitalization of energy systems?
- **Market design:** What are the policy and regulatory requirements to maximise the benefits and mitigate risks related to a lack of observability and control of DER?
- **Challenges and lessons learned:** What are the challenges when implementing digital solutions to leverage and optimise DER and how can they be overcome?
- **Financing:** How was the digital solution financed in your case and how did this affect the outcome?
- **Next steps:** What are future plans and prospects for digitalisation as an accelerator for DER?

Panel 2 will focus on the following questions:

- **Identifying opportunities:** Where do regulators see the immediate opportunities and benefits to promote the digitalization of energy systems?
- **Market design:** What regulatory initiatives have been undertaken or are being planned in your jurisdiction to deploy digitalisation in support of DER?
- **Key challenges:** What are concrete challenges inhibiting regulators to accelerate digital solution frameworks for DER and more concretely, for DPV?
- **Financing:** how to finance digital solutions in the context of your specific market design and tariff structure?
- **Next steps:** What are future plans and prospects for digitalisation as an accelerator for DER?