

3 CUSTOMER DOMAIN

Digitalization in the energy sector in Chile

Prosumer &
P2P trades

Retailing,
billing & customer
orientation

This class contains the uses
whose focus is on the end
user and how this
participates in the system,
considering aspects such as
billing or the existence of
the prosumer as a relevant
agent for the energy system.

Application presence by country

Uses/Applications	Germany	Finland	Japan	China	USA	UK	Sweden	France	South Korea	Singapore
Prosumer & P2P trades										
Retailing, billing & customer orientation										

Application potential by sector

Uses & Applications	Transportation	Industry	Buildings	Electricity Generation	Finance	Public Sector	Main type of energie
Prosumer & P2P trades							Electricity and fossil fuels
Retailing, billing & customer orientation							Electricity and fossil fuels

Enabling Technologies

Technologies	Load monitor	In home display	Smart thermostat	Smart light	Smart plug/switch	Smart appliance	Hub	Smart meters	AMR/AMI	V2G	EV/PHEV	IED (relays, SCADA,...)	PMU	WAMS	Smart Sensors	Sensor and actuator	LAN/HAN/WAN	Cloud	5G	Machine learning	Data mining	Nature inspire	ANN	Multi-agent systems	Clustering	NLP	Digital twin	Autonomous vehicle	Blockchain	Actuators	3D printers
Uses & Applications	Smart home & Smart building							Smart grid							IoT & IoE				Big data, machine learning & AI											Physical action	
Prosumer & P2P trades																															
Retailing, billing & customer orientation																															

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3.1 Prosumer & P2P trades

Prosumer means generator and consumer, e.g., household with photovoltaic units. Peer-to-peer energy (P2P) trading is the buying and selling of energy between two or more grid-connected parties.

Common examples

- ▶ P2P energy trading platforms such as blockchain will allow consumers to share their excess energy amongst one another and control how it's distributed through the grid. Using blockchain, all transactions are public and once on the blockchain cannot be altered in any way creating full transparency.

Opportunities

- ■ ■ ■ ■ It contributes in terms of flexibility or balance, from an economic point of view.
- ■ ■ ■ ■ Those without solar panels are still able to access renewable energy at a reasonable price from their neighbors.
- ■ ■ ■ ■ Encourage the participation of citizens in existing or new markets.

Information, infrastructure and regulation requirement

- ▶ Updating the laws that encourages this participation is required.
- ▶ Smart meter required

Barriers

- ■ ■ ■ ■ **Others:** Lack of participation
- ■ ■ ■ ■ **Infrastructure:** Dependence on an internet connection with a highly secure system.
- ■ ■ ■ ■ **Security:** The sovereignty of the information processed must be determined and who or whom would have access to said information must be defined; there must be a cybersecurity system capable of dealing with possible attacks.

Application synergies

- ▶ In order to have the prosumer status it's necessary to have **DER (2.4)** to inject power to the main grid.
- ▶ Prosumers can be in **DSM (2.1)** programs in order to get revenues for injecting/consuming in certain hours of the day.
- ▶ P2P trades would be impossible without smart grid technologies such as **Feeder automation (1.2)** or **Smart substation (1.1)**.



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International real application



Power Ledger

Power Ledger is an Australian technology company that has developed a blockchain-enabled peer-to-peer renewable energy trading platform. The platform facilitates the buying and selling of renewable-generated electricity in real time, enabling users with solar panels to trade their excess

solar energy with their neighbors. Currently, it has 22 projects across eight countries including Australia, the United States, Italy and Thailand.

Examples of international goals

▶ Check goals of DER to know more in terms of penetration level.



Lack of participation seeks to be solved with incentives through taxes, fees or the promotion of other measures, such as energy storage.



In order to move towards a more modern energy matrix, there are important gaps such as the improvement of the feed-in-tariff or upgrades to the "Act on the Digitization of the Energy Transition" which obliges users to generate more than 1kW from solar energy to install a smart meter on their own.



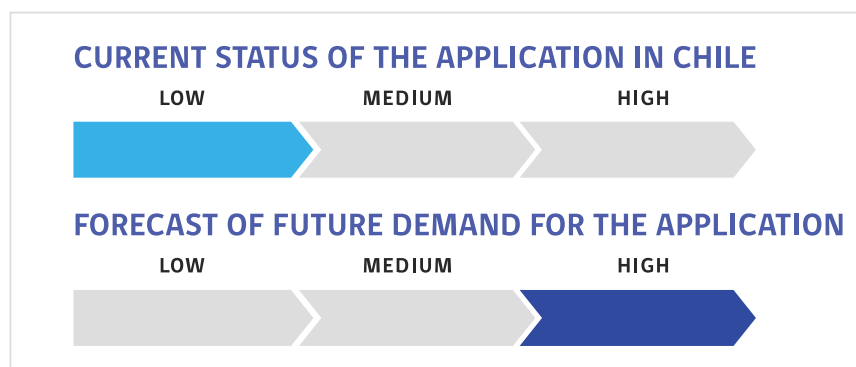
It's necessary to overcome the lack of a clear objective and increase the limit of 255kW for the tax exemption.

National key partners and resources



Public policies recommendations to Chile

▶ Promote the entry of prosumers to the electricity market, incorporating economic incentives (taxes, tariffs) or the promotion of other complimentary measures (e.g. energy storage).



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3.2 Retailing, billing & customer orientation

Retailing: Retailers trade power to consumers and may aggregate or broker DER between market or consumers in the future. Most are connected to a trading organization to allow participation in the wholesale market. **Billing:** Managing consumer billing information, sending billing statements, and processing received payments. **Customer orientation** applications use a variety of digital technologies and mostly aim at providing a benefit to the customer, which in some cases could be monetized by the service provider. These applications offer additional benefits to the user and increase revenues.

Common examples

- ▶ If a client wants the energy s/he is consuming to be only of renewable origin, through the retail market it is possible to deliver this type of services



Since 2001, the Energy Market Authority (EMA) has progressively opened the retail electricity market to competition. Their options are to buy electricity from: (i) An electricity retailer; or (ii) The wholesale electricity market; or (iii) (Default) SP Group at the regulated tariff. The Open Electricity initiative includes digital services oriented to help users to make informed decisions, for instance, an online price comparison tool.



Since the French electricity and natural gas markets were fully opened up to competition on the 1st of July, 2007, consumers have been free to choose their energy supplier. The non-residential market is much more open (36% of sites pay market rates) than the residential sector (where just 19% of homes pay market rates).

Opportunities



This use entails an improvement in the user experience, through a feeling of closeness and transparency on the part of the electricity companies.

Information, infrastructure and regulation requirement

- ▶ Smart meters are necessary to participate in energy retail market.
- ▶ Information given to customers must be clear in order to maintain a good relation with them.

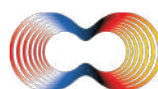
Barriers



Regulatory: A regulatory reform is required that must be tailored to the reality of each country in order to ensure competition in the retail energy market.



Security: Information must be safeguarded.



ENERGY PARTNERSHIP
CHILE-ALEMANIA



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Retailing, billing & customer orientation



Application synergies

- ▶ Improvement of user experience and engagement in this and other uses (e.g., EV (5.1), DSM (2.1)).
- ▶ With Process optimization & automation (4.1) it's possible to automate certain processes in order to improve customer experience.

International real application

Community choice aggregators (CCA) it's a way to participate in the retail market, in which local entities in the United States aggregate the buying power of individual customers within a defined jurisdiction in order to create large contracts with generators, something individual buyers may be unable to do. Marin County launched California's first CCA program, Marin Clean Energy (MCE), on May 7, 2010, offering 60%–100% renewable energy at competitive and stable rate. The CCA provides electricity service to more than 480,000 customers⁶.



⁶ Marin Clean Energy, Available on <https://www.mcecleanenergy.org/>

Examples of international goals

- ▶ No specific targets were found

National key partners and resources



Public policies recommendations to Chile

- ▶ Regulation must be updated in order to allow retail competition.
- ▶ Promote the implementation of smart meters to facilitate the introduction of this type of schemes and to improve the quality of customer service.

