

SMART  
GRID  
1

DER  
MANAGEMENT  
2

CUSTOMER  
DOMAIN  
3

PROCESS  
MANAGEMENT  
4

MOBILITY  
5

DATA  
MANAGEMENT  
6

SMART CITY  
7

OTHERS  
8

4

PROCESS  
MANAGEMENT

# Digitalization in the energy sector in Chile

Process Optimization & Automation

Emission monitoring

This class is associated with uses whose objective is to improve processes associated with energy generation and / or consumption and also for internal processes.

## Application presence by country

Uses/Applications	Germany	Finland	Japan	China	USA	UK	Sweden	France	South Korea	Singapore
Process Optimization & Automation										
Emission monitoring										

## Application potential by sector

Uses & Applications	Transportation	Industry	Buildings	Electricity Generation	Finance	Public Sector	Main type of energie
Process Optimization & Automation							Electricity and fossil fuels
Emission monitoring							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	
Process Optimization & Automation																															
Emission monitoring																															



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# Digitalization in the energy sector in Chile



## 4.1 Process optimization & automation

The incorporation of this use entails an improvement in the efficiency of the processes through the deployment of equipment and technology.

### Common examples



Energy Story is a program of the Singapore Ministry of Commerce and Industry, and one of its 4 lines of work is related to the optimization of the electric power generation process using gas as a source, in order to improve the efficiency of the processes through the deployment of equipment and technology.

### Opportunities



Reduction of operational costs.



Facilitate continuous productivity throughout the day.



Reduce human errors.



Creation of new job profiles.



Improve customer experience.



Increase satisfactory levels of employees.

### Information, infrastructure and regulation requirement

- ▶ Infrastructure is needed to automate processes.
- ▶ Constant communication with workers must be maintained during the automation process.

### Barriers



**Economic:** high investment cost.



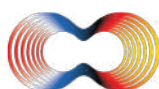
**Human capital:** resistance from employees.



**Others:** limited applicability for some class of problems; increased dependence on non-humans.

### Application synergies

- ▶ The automation of some processes related to client service could lead to a better **customer orientation** (3.2).



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# Process optimization & automation



## International real application



Xcel Energy (electric and gas utility in US) uses sensor data in wind turbines to develop high-resolution wind forecasts through predictive analytics and artificial intelligence, thanks to which it has been able to reduce costs for end customers by \$ 60 million as a result of the increase in generation efficiency.

## Examples of international goals



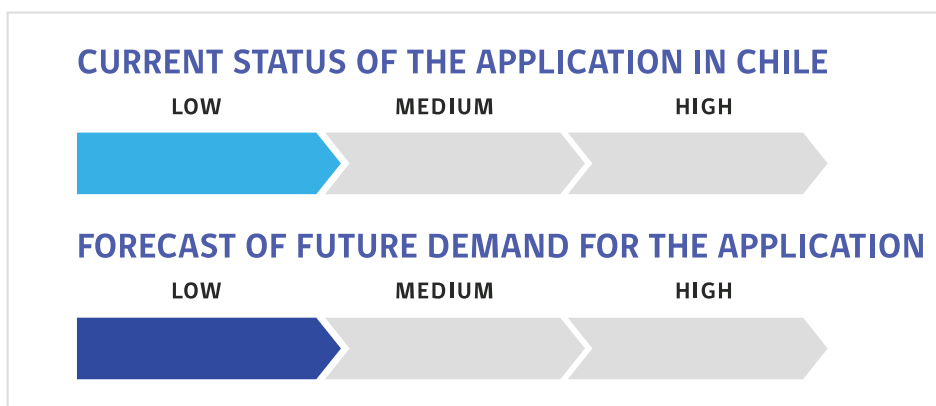
The European Commission stated that artificial intelligence could contribute up to EUR 13.33 trillion to the global economy in 2030.

## National key partners and resources



## Public policies recommendations to Chile

- ▶ Promote digitalization on small and medium companies through economic instruments.
- ▶ The incorporation of automation initiatives has to be carried out in an informed manner.



# Digitalization in the energy sector in Chile



## 4.2 Emission monitoring

Emission monitoring refers to detecting, measuring, and avoiding methane emissions. It aims to provide effective monitoring and quantification of emission levels at low cost.

### Common examples

- ▶ In order to comply with the agreed international treaties regarding the amount of emissions (for example the Paris agreement), it is necessary to have an emissions monitoring system to ensure their correct accounting.



The US Environmental Protection Agency (EPA) created the Emission Measurement Center (EMC) that provides information on test methods for measuring pollutants from smokestacks and other industrial sources.

### Opportunities



It facilitates decision-making and mitigation actions according to the situation and context.

### Information, infrastructure and regulation requirement

- ▶ Monitoring system infrastructure
- ▶ Use of Big Data applications to capture, store and process large amounts of data associated with methane emissions.

### Barriers



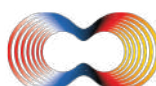
**Economic:** lack of economic incentives for the main emitters of pollutants; high cost of modernizing monitoring systems.



**Security:** unavailability to access all the necessary information.

### Application synergies

One of the sectors where emission monitoring is necessary is mobility (e.g., [Personal transport \(5.1\)](#), [Public transport \(5.2\)](#), [Cargo transport \(5.3\)](#)), in order to make public policies according to the context.



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## International real application



**Eco Analysis Corporation**  
an Associated Company of Fujitsu

Eco Analysis Corporation is a Japanese company that provides environmental monitoring systems that are highly cost-effective and count with total support from system introduction planning through system design, construction, and operation. They also provide environmental analysis data.

## Examples of international goals



The goal is to reduce emissions to zero by 2050, and for that, emission monitoring becomes relevant in verifying that the objectives are being met. A better management of uncertainty is also crucial to achieve the desired results with emission monitoring.



Both the USA and Japan seek to reduce emissions to zero by 2050. Just as the United States, Japan has a continuous emissions monitoring system to support the fulfillment of this goal. Despite having emission



monitoring systems, the main gap for the objective of this use is the need for a change in people's behavior and business ethics.

## National key partners and resources



## Public policies recommendations to Chile

- It's necessary to adopt technologies that manage uncertainty in a better way, such as forecasting and predictive analysis.

