

A decorative border of various energy-related icons (solar panels, wind turbines, water droplets, lightning bolts, etc.) surrounds the central text. A horizontal bar with blue and red segments is positioned above the main title.

# MONTHLY NCRE REPORT

# CNE

A solid blue horizontal bar.

VOLUME No.

# 3

November 2016

## HIGHLIGHTS

During the last month, the energy sector has witnessed a series of milestones that reflect the hard work of both the National Energy Commission and the Ministry of Energy. The following are among the principal achievements:

### **Authorities and traders participate in the 2nd meeting "Firewood: the southern heat"**

With the aim of knowing the improvements in relation to 2016 firewood policy, introduced to President Michelle Bachelet in March of this year, 300 people gathered on November 15<sup>th</sup> in the region of La Araucanía to give life to the second version of the meeting National "Firewood, Heat of the South".

The activity was led by the Minister of Energy, Andrés Rebolledo; the executive director of CONAF, Aarón Cavieres; the Undersecretary of the Environment Minister, Marcelo Mena and academics from the region, who spoke with producers and firewood traders on the challenges proposed by the first government policy, focused to this topic in our country.

During 2016, 81 firewood producers and traders, between O'Higgins and Aysén region, were benefited thanks to the "More Dry Firewood" program of the Ministry of Energy, for the implementation of projects that increase the production of this type of firewood. This initiative includes the construction of Collection and Drying Centers, but also incorporate technology and innovative techniques of drying wood, in line with training and education of human capital in drying techniques and business development.

### **Ministry of Energy launches Energy Efficiency Campaign**

The Ministry of Energy launched on November 11<sup>th</sup>, 2016 the energy efficiency campaign "The Energy Challenge", which aims to raise awareness and provide simple household energy saving tips.

Some of the most common recommendations in aim to save energy in homes are, for example, buying electrical appliances rated A, A + or higher, cooking with pots covered or saving the boiled water in a thermos.

For more information and tips on Energy Efficiency, visit <http://www.energia.gob.cl/elreto/>

### **COP22: Advances of Chile in mitigation actions**

In the framework of the 22<sup>nd</sup> Conference of the Parties (COP 22), under the United Nations Framework Convention on Climate Change, held between 7 and 18 November in Morocco, the Head of the Sustainable Development Division of the Chilean Ministry of Energy, Nicola Borregaard, exposed the actions in process to attract the necessary investment to comply with the Nationally Determined Contribution (NDC) compromised by Chile in the Paris Agreement.

Borregaard mentioned the relevance of the Chilean Energy Agenda to increase the investment in the sector, specifically in renewable energies, as well as the role of the authority to introduce regulatory improvements creating by those more attractive the private sector's interest in contributing to the development of Energy Matrix. He also highlighted the environmental and social considerations of the aforementioned Agenda and underlined Chile's pioneering experience in South America with the implementation of a CO2 tax that seeks to internalize the socio-environmental cost that these emissions cause.

In reference to the development of climate change policies and strategies, Nicola Borregaard highlighted the relevance of international cooperation in Chile and highlighted the contribution of the World Bank through its Partnership for Market initiative.

### **Victoria Hospital joins the solar energy revolution**

Since November 8, Victoria Hospital has been using more than 90 solar collectors to supply hot water, a project that had an investment of \$ 155 million and was inaugurated by Energy Minister, Andrés Rebolledo.

It will benefit 100 thousand people and will prevent the emission of 110 tonnes of CO2 per year.

## SUMMARY

October ended with 38 renewable energy projects declared under construction according to Exempt Resolution N° 736/2016, released by the National Energy Commission (CNE), specifying that the operation dates for the projects is foreseen between November 2016 and August 2018.

The installed capacity of renewable energy is now 13.72% (2,872 MW), with SIC concentrating almost 90% of the projects.

The output of NCRE power plants to the grid during last month reached 958 GWh, which represents 16.11% of the total generation. Regarding the legal requirements, that forces conventional generators to certify that a percentage of their generation comes from NCRE sources, the obligation of 246 GWh, was almost doubled by the 688 GWh declared by the generators. The technology analysis indicates that 235 GWh were solar injection, 170 GWh were wind farms, 152 GWh from small hydro plants and 131 GWh from bioenergy.

Finally, during October, the Environmental Evaluation Service (SEA) did not evaluate new NCRE projects and gave an approved RCA to five projects (245 MW, 405 MMUSD investment).

**Summary – NCRE Project Status**





| Technology      | Operation [MW] | Construction [MW] | RCA Approved [MW] | Under Evaluation [MW] |
|-----------------|----------------|-------------------|-------------------|-----------------------|
| Biomasa         | 410            | 0                 | 112               | 87                    |
| Biogás          | 49             | 0                 | 8                 | 0                     |
| Eólica          | 1.021          | 379               | 6.593             | 2.180                 |
| Geotermia       | 0              | 48                | 120               | 0                     |
| Mini Hidro (**) | 435            | 22                | 476               | 92                    |
| Solar – PV      | 958            | 1.480             | 13.136            | 5.581                 |
| Solar – CSP     | 0              | 110               | 1.085             | 1.270                 |
| Total           | 2.873          | 2.039             | 21.530            | 9.210                 |

Source: CNE, SEIA, CDEC-SIC / CDEC-SING, November 2016.

(\*) It takes into account projects ready for commercial operation and those connected on trial phase.



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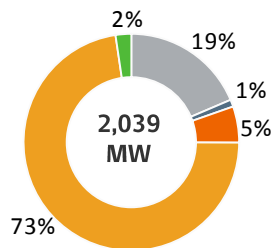


## STATUS OF RENEWABLE ENERGY PROJECTS

### 1 Electricity Generation Projects Under Construction

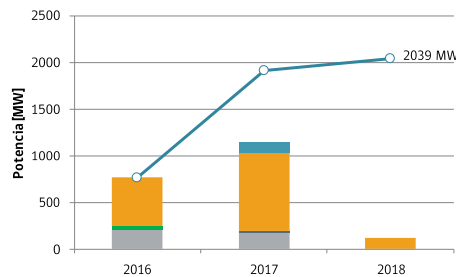
According to Exempt Resolution N° 736/2016, released by the National Energy Commission (CNE), that "Updates and Communicates Construction Projects", there are 38 renewable energy projects under construction by October 27th, 2016, corresponding to a power of 2,039 MW. These projects should be operating between November 2016 and August 2018.

#### NCRE Projects Under Construction

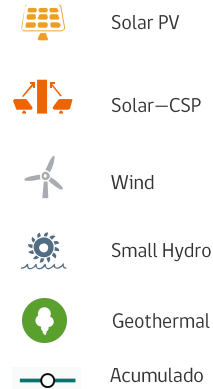


Source: CNE, November 2016.

#### Starting Operation Date Forecast



Source: CNE, November 2016.

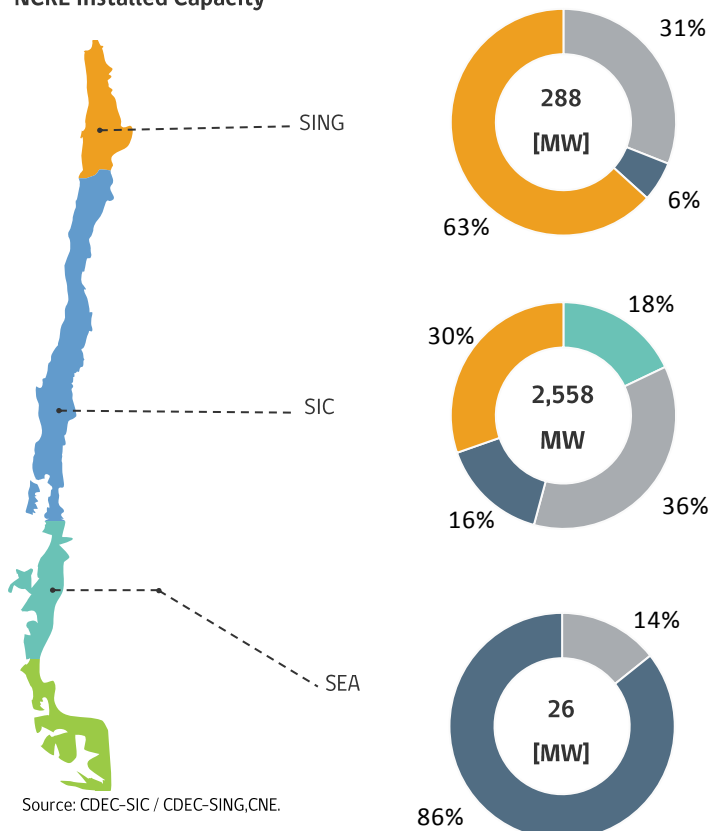


### 2 Installed Capacity for Electricity Generation

The installed capacity of projects based on renewable energy, recognized as such by Chilean regulations (NCRE), on October 31th, 2016, reached 2,872 MW (\*). 89.06% (2,558 MW) is located on SIC (Central Interconnected System), 10.02% (288 MW) is connected to the SING (Northern Interconnected System) and the 0.92% (26 MW) left, belongs to the Electrical System of Aysén.

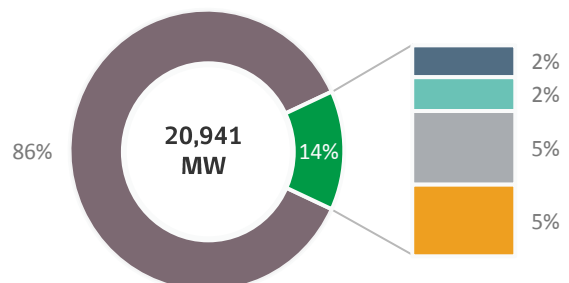
The NCRE installed capacity represents an 13.72% of the total electrical capacity of the Chilean distribution systems.

#### NCRE Installed Capacity



Source: CDEC-SIC / CDEC-SING, CNE.

#### Conventional Technologies and NCRE into the Chilean Grids



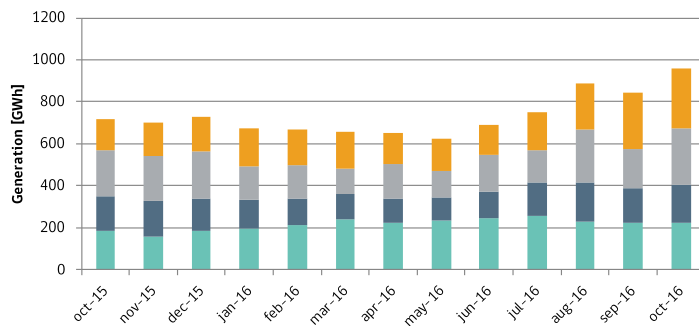
(\*) In addition, there are 31 NCRE power plants on trial with a total of 585 MW operating on SIC, and SING has 3 power plants on trial for other additional 164 MW. (\*) The total installed capacity also includes Los Lagos (1 MW).

### 3 Electricity Generation

Electricity generation for the major electrical distribution systems reached 5,948 GWh during October 2016. 958 GWh of them come from ERNC sources.

Separated by technology we get that 30.00% (288 GWh) was generated by solar farms, followed by a 27.57% (264 GWh) by wind, in third place was bioenergy, with 23.43% (225 GWh), then small hydro with 19.00% (182 GWh).

#### NRCE Electricity Generation Evolution



Source: CDEC-SIC / CDEC-SING, CNE, November 2016.

#### Electricity Generation Variation

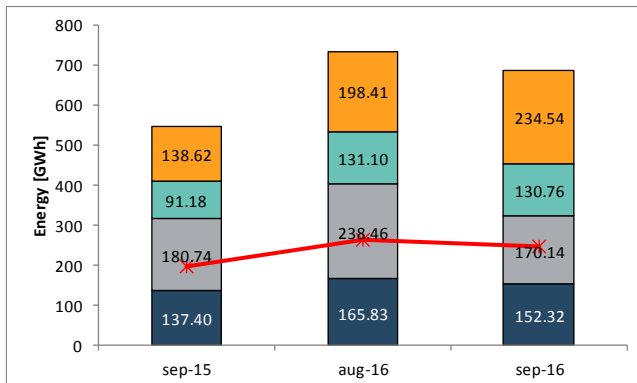
|              | Generation [GWh] |   | Monthly |   | Annual |
|--------------|------------------|---|---------|---|--------|
| NCRE         | 958              | ↑ | 14.0%   | ↑ | 33.2%  |
| Conventional | 4,990            | ↓ | -0.3%   | ↓ | -7.1%  |
| Total        | 5,948            | ↑ | 1.7%    | ↓ | -2.4%  |

(\*) Electricity Generation includes all the power plants considered into the Law 20.257

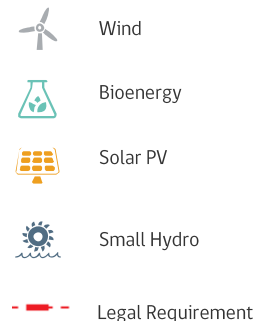
### 4 Compliance with Laws 20,257 and 20,698

According to the ERNC balance released by the Independent System Operators, corresponding to September 2016, the obligation defined by Laws 20,257 and 20,698 was of 245.54 GWh of electricity generation from a NCRE source. During that period the recognized NCRE energy put into the system reached 687.75 GWh (276.58% of the requirement), with a shared of 234.54 GWh from solar, 170.14 GWh from wind, 152.32 GWh from small hydro plants and 130.76 GWh from bioenergy.

#### Technology NCRE Laws Compliance



Source: CDEC-SIC / CDEC-SING, CNE, November 2016.





## PROJECTS UNDER ENVIRONMENTAL EVALUATION

### 1. New Projects on Environmental Evaluation

During September, the Environmental Evaluation Service (SEA) started evaluating six new NCRE projects totaling 641 MW and 1,062 MMUSD of investment. Three of the projects are solar PV technology, two are a wind farm, and the last one is a small hydro plant.

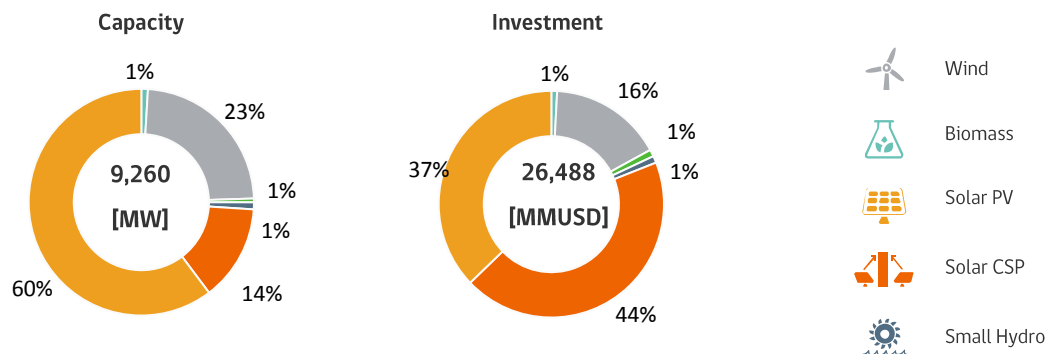
| Technology  | Region | Company                       | Project Name                              | Capacity [MW] | Investment [MMUSD] | Date        | Link                 |
|-------------|--------|-------------------------------|---|---------------|--------------------|-------------|----------------------|
| Small Hydro | X      | HIDROELÉCTRICA LUMEN SA       | Parque Eólico La Esperanza II             | 18            | 15                 | 23-sep-2016 | <a href="#">Link</a> |
| Solar – PV  | IV     | GR Huingan SpA                | Proyecto Fotovoltaico “Aurora del Huasco” | 50            | 16                 | 23-sep-2016 | <a href="#">Link</a> |
| Solar – PV  | II     | TSGF SpA                      | Planta Fotovoltaica Alturas de Ovalle     | 6             | 600                | 22-sep-2016 | <a href="#">Link</a> |
| Solar – PV  | RM     | Diana Solar SpA               | Planta Bioenergía Ñuble                   | 20            | 15                 | 22-sep-2016 | <a href="#">Link</a> |
| Wind        | IX     | Parque Eólico San Gabriel SpA | Parque solar fotovoltaico El Laurel       | 9             | 360                | 22-sep-2016 | <a href="#">Link</a> |
| Wind        | VIII   | Eólica La Esperanza S.A.      | Parque Solar Fotovoltaico Ovejería        | 9             | 56                 | 21-sep-2016 | <a href="#">Link</a> |

Source: SEIA, CNE.

### 2 Projects undergoing Environmental Evaluation

On October 2016, there were 98 NCRE projects undergoing qualification by the SEIA. From this total, 4 are biomass power plants, 25 wind farms, 1 is a geothermal project, 8 small hydro, 4 solar CSP, and 56 solar PV. All the projects added 9,260 MW and 26,488 MMUSD of investment.

#### NCRE Projects Distribution



Source: SEIA, CNE, November 2016.

### 3 Project with Environmental Qualification Resolution

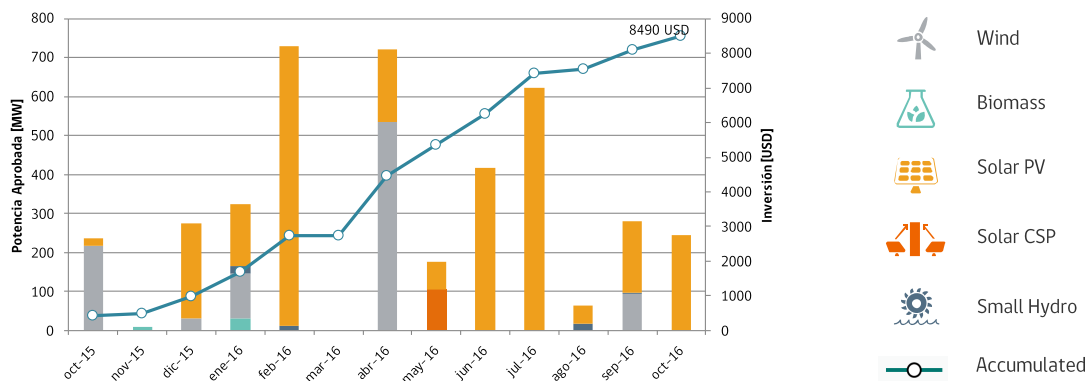
During October, the Environmental Evaluation Service (SEA), gave five Environmental Qualification Resolutions (RCA) to NCRE projects, totalling 245 MW and an investment of 405 MMUSD. All of them are solar photovoltaic plants.

| Technology | Region | Company                   | Project Name                        | Capacity [MW] | Investment [MMUSD] | Date        | Link                 |
|------------|--------|---------------------------|-------------------------------------|---------------|--------------------|-------------|----------------------|
| Solar - PV | III    | ACCIONA ENERGÍA CHILE SpA | PLANTA FOTOVOLTAICA MALGARIDA II    | 163           | 283                | 06-oct-2016 | <a href="#">Link</a> |
| Solar - PV | VI     | EL QUEULE SPA             | PARQUE SOLAR FOTOVOLTAICO EL QUEULE | 8             | 11                 | 04-oct-2016 | <a href="#">Link</a> |
| Solar - PV | III    | Parque Solar Domeyko Spa  | Parque Solar Domeyko                | 60            | 90                 | 25-oct-2016 | <a href="#">Link</a> |
| Solar - PV | VI     | GR Lingue SpA             | Parque Solar Fotovoltaico Panquehue | 7             | 10                 | 12-oct-2016 | <a href="#">Link</a> |
| Solar - PV | V      | GR Guayacan SpA           | Parque Solar Fotovoltaico Cabilsol  | 7             | 11                 | 12-oct-2016 | <a href="#">Link</a> |

Source: SEIA, CNE, November 2016.

The following graph, presents the 12 months evolution of approved projects by the SEIA. The total investment during that period was 8,490 MMUSD, and the total power was 4,100 MW.

#### Evolution of NCRE Projects with approved RCA



Source: SEIA, CNE, November 2016.





## ENERGY GEOTHERMAL LICENSES

The Ministry of Energy is responsible for the administration of Law No. 19,657 appliance, which applies to Geothermal Energy Concessions and regulate the process and evaluations for geothermal energy concessions, requests for extension of exploration concessions and enforcement of the law and its implementing regulations.

A geothermal concession is an administrative act –granted by the State– where is authorized a natural or legal person to carry out exploration or exploitation of geothermal energy in a given area.

A geothermal exploration concession confers the right to conduct studies, measurements and other investigations to determine the existence of sources of geothermal resources, its physical and chemical characteristics, their geographical spread and their skills and conditions for its use, with a period of two years, renewable for two additional years.

A geothermal exploitation concession confers the right to use and exploit geothermal energy that exists within its boundaries, including: conducting drilling activities, construction, commissioning and operation of a geothermal power plant, with an indefinite term and covered by compliance with the obligations for the concessionaire in the concession decree and payment of an annual fee.

Below are the concessions Exploration and Exploitation of Geothermal Energy Ongoing through August 2016:

| Concession   | Owner                                       | Region(s)                   | Province(s)        | Commune(s)                      | Area [HA] |
|--------------|---|-----------------------------|--------------------|---------------------------------|-----------|
| CARCOTE      | SERVILAND MINERGY S.A                       | ANTOFAGASTA                 | EL LOA             | CALAMA-OLLAGÜE                  | 99,000    |
| CARITAYA     | SERVILAND MINERGY S.A                       | ARICA Y PARINACOTA-TARAPACÁ | ARICA-DE TAMARUGAL | CAMARONES-HUARA-CAMIÑA-COLCHANE | 98,600    |
| LASCAR       | TRANSMARK CHILE SpA                         | ANTOFAGASTA                 | EL LOA             | SAN PEDRO DE ATACA-             | 24,000    |
| LATARANI 1   | ENERGÍA ANDINA S.A.                         | TARAPACÁ                    | DEL TAMARUGAL      | COLCHANE-HUARA                  | 1,000     |
| LATARANI 2   | ENERGÍA ANDINA S.A.                         | TARAPACÁ                    | DEL TAMARUGAL      | COLCHANE                        | 800       |
| LINZOR       | TRANSMARK CHILE SpA                         | ANTOFAGASTA                 | EL LOA             | CALAMA                          | 33,000    |
| OLCA         | COMPAÑIA MINERA DOÑA INES DE COLLAHUASI SCM | TARAPACÁ – ANTOFAGASTA      | TAMARUGAL-EL LOA   | PICA-OLLAGUE                    | 2,500     |
| PUCHULDIZA 3 | MRP CHILE EXPLORACIÓN LIMITADA              | TARAPACÁ                    | DEL TAMARUGAL      | COLCHANE                        | 3,000     |
| TIMALCHACA   | SERVILAND MINERGY S.A                       | ARICA Y PARINACOTA          | ARICA-PARINACOTA   | ARICA-CAMARONES-PUTRE           | 68,000    |
| EL VALLE     | TRANSMARK CHILE SpA.                        | ARAUCANÍA                   | CAUTÍN             | PUCÓN-CURARREHUE                | 18,200    |
| LLONQUEN     | TRANSMARK CHILE SpA.                        | LOS RIOS                    | VALDIVIA           | PANGUIPULLI                     | 16,200    |
| EL ENCUENTRO | EMPRESA GENERADORA EGENGEO S.A.             | METROPOLITANA               | CORDILLERA         | SAN JOSE                        | 15,600    |

Source: Ministry of Energy

## 2. Existing Exploitation Concessions

| Concession       | Owner                               | Region(s)                       | Province(s)   | Commune(s)                  | Area [HA] |
|------------------|-------------------------------------|---------------------------------|---------------|-----------------------------|-----------|
| APACHETA         | GEOTERMICA DEL NORTE S.A            | ANTOFAGASTA                     | EL LOA        | OLLAGÜE                     | 8,100     |
| CHILLAN          | EMPRESA NACIONAL DE GEOTERMIA S.A   | BIOBÍO                          | ÑUBLE         | COIHUECO-PINTO              | 8,400     |
| EL TATIO         | GEOTERMICA DEL NORTE S.A            | ANTOFAGASTA                     | EL LOA        | CALAMA                      | 4,160     |
| LA TORTA         | GEOTERMICA DEL NORTE S.A            | ANTOFAGASTA                     | EL LOA        | CALAMA-SAN PEDRO DE ATACAMA | 5,400     |
| LAGUNA DEL MAULE | COMPAÑIA DE ENERGÍA LIMITADA ENERCO | DEL MAULE                       | TALCA-LINARES | SAN CLEMENTE-COLBUN         | 4,000     |
| PELLADO          | COMPAÑIA DE ENERGÍA SPA             | DEL MAULE                       | TALCA-LINARES | SAN CLEMENTE-COLBUN         | 16,000    |
| ROLLIZOS         | SAMUEL SANTA CRUZ                   | DE LOS LAGOS                    | LLANQUIHUE    | PUERTO VARAS                | 260       |
| TINGUIRIRICA     | ENERGÍA ANDINA S.A                  | DEL LIBERTADOR GENERAL BERNARDO | COLCHAGUA     | SAN FERNANDO                | 6,175     |
| TRINIDAD I       | INVERSIONES PUYEHUE LIMITADA        | LOS LAGOS                       | OSORNO        | PUYEHUE                     | 315       |
| TRINIDAD II      | INVERSIONES PUYEHUE LIMITADA        | LOS LAGOS                       | OSORNO        | PUYEHUE                     | 243       |

Source: Ministry of Energy



## DISTRIBUTED ENERGY GENERATION LAW

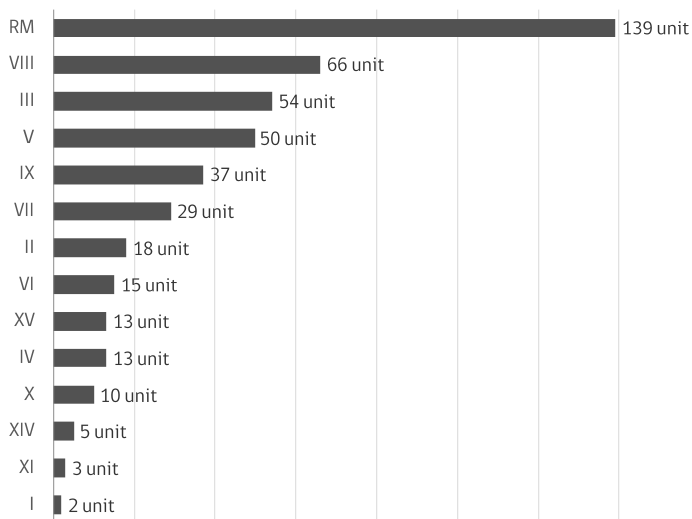
Energy generation by the citizen is established by Law No. 20,571, is a system that allows the self-generation of energy based on Non-Conventional Renewable Energy (NCRE) and efficient cogeneration. This law, also known as Net Billing, Net metering or distributed energy generation, delivers the permission to energy customers to become energy generators by selling their generation directly to the electricity distributor at a regulated price, which is published on the website of each distributor.

All power generation system which would like to generate energy under this regulation, must declared to the Superintendency of Electricity and Fuels (SEC in Spanish) its installations. This declaration must be made by an authorized installer, and must also contain the technical details of the installation and use of products. Subsequently, the SEC will oversees the installation and only if it fulfills the technical requirements will authorized its operation. Hereafter the owner must notify the network connection to the electricity distribution company.

Down below the list of facilities declared to the SEC by the electric procedure No. 4 from September, 2016.

### 1. Facilities declared

Number of facilities declared by region



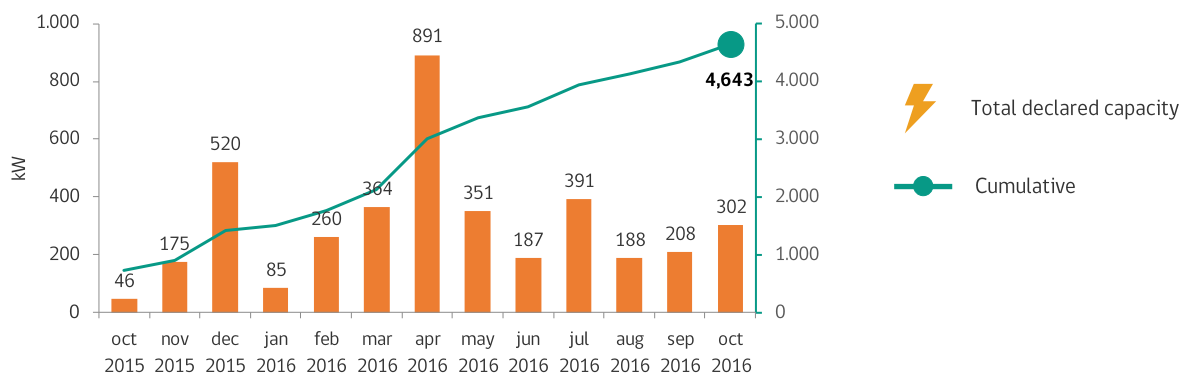
Source: SEC

Detail of facilities declared by region

| Region               | Quantity [unit] | Capacity [kW] |
|----------------------|-----------------|---------------|
| RM                   | 122             | 35,8%         |
| VIII                 | 56              | 16,4%         |
| V                    | 34              | 10,0%         |
| III                  | 27              | 7,9%          |
| VII                  | 22              | 6,5%          |
| IX                   | 18              | 5,3%          |
| II                   | 15              | 4,4%          |
| VI                   | 13              | 3,8%          |
| XV                   | 10              | 2,9%          |
| IV                   | 9               | 2,6%          |
| X                    | 7               | 2,1%          |
| XIV                  | 5               | 1,5%          |
| XI                   | 2               | 0,6%          |
| I                    | 1               | 0,3%          |
| <b>Overall total</b> | <b>341</b>      | <b>100,0%</b> |

Source: SEC

Declared capacity evolution in the last 12 months



Source: SEC

## **National Energy Commission of Chile**

Avenida Libertador Bernardo O'Higgins , 1449  
Edificio Santiago DownTown, Torre 4, Piso 13

Tel. (2) 2797 2600

Fax. (2) 2797 2627

**[www.cne.cl](http://www.cne.cl)**

*Santiago - Chile*