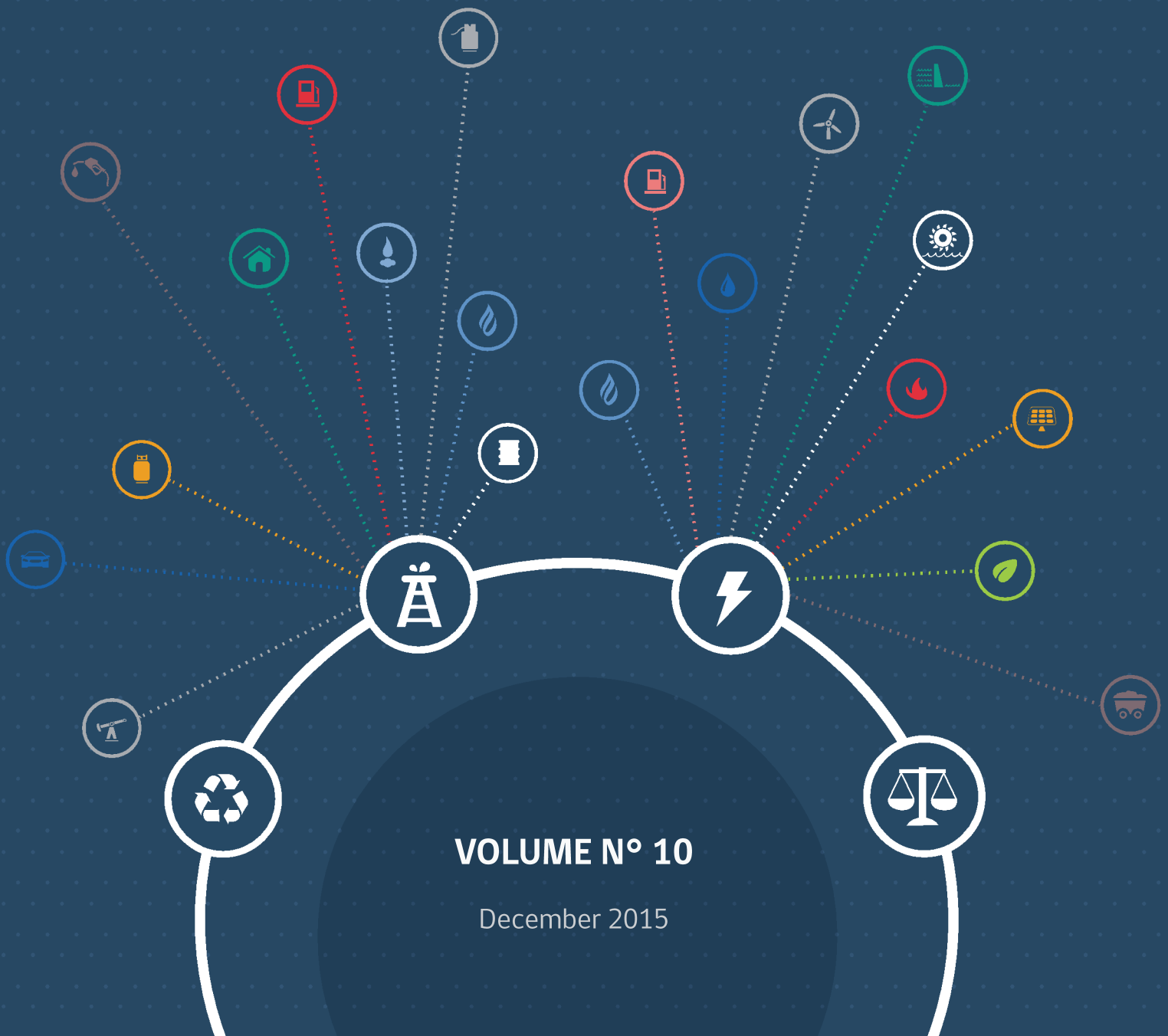
MONTHLY ENERGY SECTOR REPORT

NATIONAL ENERGY COMMISSION



VOLUME N° 10

December 2015

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:

CNE participates in CDEC-SING seminar in Iquique

The Executive Secretary of the National Energy Commission, Andrés Romero, participated in the "Energy Challenges in the Norte Grande" seminar at the Center for Economic Load Dispatch of the Norte Grande Interconnected System (CDEC SING) on November 13.

The meeting was attended by representatives of the regional government, the regional energy ministries of Arica and Parinacota and Tarapacá, as well as representatives of academia, companies which form part of the Norte Grande system, and from different industries in the area.

At the event, the Executive Secretary of the CNE gave a presentation on the amendments to the Electricity Act, and their implementation. These modifications include the linking of Chile's two interconnected systems and the creation of a National Coordinator.

During the seminar, there was a panel moderated by the acting chairman of the board of the CDEC-SING, Francisco Aguirre. The panel also included the Executive Director of the CDEC-SING, Daniel Salazar, the CEO of E-CL, Axel Leveque, and the academic expert and Director of the Chilean Solar Energy Research Center (SERC Chile), Rodrigo Palma.

Budget Law 2016: 9.6% increases in resources for the Energy sector

The "Draft Budget Law 2016" was ready for enactment, after being approved by the Senate on November 25. This initiative includes a 9.6% increase (145.7 billion Chilean pesos) in resources for the Ministry of Energy that will enable the continued implementation of the Agenda for Energy, among other things.

The growth of Ministry of Energy's budget takes account of its other services and programs. The National Energy Commission (CNE) will have $5.4 billion in funding, which represents a budget increase of 2.2% compared to 2015.

The CNE's growth in 2016 corresponds to studies associated with quadrennial tariff processes; the analysis of value-added distribution (VAD); and additional factors, such as the annual expansion plan and evaluation of the profitability of gas distribution companies.

The President of Chile attends COP 21 in Paris

Michelle Bachelet, the President of Chile, along with the Minister of Energy, Máximo Pacheco, attended the 21st Conference of the Parties of the UN Framework Convention on Climate Change (COP) in Paris in late November.

Representatives of 194 countries and the European Union attended the event. The leaders meet annually to review and develop the negotiation process between the parties regarding new commitments and implementation tools. President Bachelet stated "although we have marginal levels of emissions, we have reaffirmed our intention to continue to be part of the solution. This includes our voluntary mitigation commitment by 2030 and submitting on time our Intended Nationally Determined Contribution. We are seeking to separate our economic growth from emissions growth, prioritizing the living conditions of the most vulnerable. Climate change is not just an environmental problem; it is also a social problem, and perhaps the biggest political issue that we are going to face over the coming years."

The negotiations to adopt a new universal system for controlling greenhouse gases will culminate in this, the twenty-first version of COP. This agreement is expected to take effect in 2020, based on individual commitments by all parties. It is thought that these will be sufficient to keep global warming below the ceiling of 1.5°C - 2°C above pre-industrial levels.

SUMMARY

This report was prepared in **December 2015** in order to provide energy information and statistics for **November 2015**.

The report's content has been organized into four chapters to facilitate analysis. These four chapters provide information about the electricity sector, international and domestic markets for oil and gas, the status and progress of environmental approvals for energy projects, and finally the main regulatory aspects affecting the sector during the month of May.

This publication contains official information from external sources as well as from the National Energy Commission (NEC).

To prepare the report, an average exchange rate of **704. pesos per USD** observed in **November 2015**.

According to Exempt Resolution 632/2015 with date **October 7th** , there were **69** electricity generation projects under construction in the SIC and SING, equivalent to a capacity of **5,355 MW.**

The installed capacity of the SIC in may was **15,838 MW** and it was **4,334 MW** in the SING, plus the installed capacity in the Aysén (SEA) and Magallanes (SEM) electricity systems. Together, the four systems with Easter Island and *Los Lagos;* in aggregate represent an installed capacity of **20,337 MW**.

Meanwhile, total electric power generation in the SIC in may was **4,250 GWh**, and in the SING it reached **1,586 GWh**. Therefore, the total generated in **November** was **5,836 GWh**, **-3.3%** higher than in **October 2015**.

The maximum hourly demand recorded in the SIC and the SING in May were **7,257 MW** and **2,412 MW**, respectively. The maximum in the SIC was recorded on November 30th while the measurement in the SING corresponds to November 2th, 2015.

Regarding electricity tariffs, it is important to note that the average marginal cost in **November** in the SIC was **38.0 USD/MWh**, a **5.9%** lower than **October 2015.** In the SING meanwhile, the average marginal cost was **72.7 USD/MWh**, **2.2%** higher than the previous month.

It is worth noting the average market prices recorded in November in the SIC and SING which were **88.0 USD/MWh** and **83.5 USD/MWh**, respectively.

In terms of international fuel prices, the Brent crude price in **November** was **44.3 USD/bbl**, **-8.8%** lower than the previous month. Meanwhile, the average price of WTI crude was **42.6 USD/bbl,** and **-7.7%** higher than the previous month.

The Henry Hub price (international natural gas price reference) decreased **-10.5%** compared to **October**, with an average value of **2.08 USD/MBtu**.

The average price of coal was **85.1** USD/ton, down **-1.3%** over the previous month.

In terms of gasoline prices, those of 93-octane gasoline (unleaded) and diesel should be noted. In May the average domestic price of the former was **CLP 719/liter**, while the average price of the latter was **CLP 503/liter**. In terms of percentages, these represent a fall of **-2.8%** and falls of **-2.1%** respectively in comparison to **October 2015**.

In regard to imports of coal, there was a decrease of -21.9% in reference to the previous month, being United States the primary country of origin. In the other hand, Ecuator was the primary country of origin for the crude oil, which also fallen down almost -26.1% this month.

A total of **17** energy sector projects were submitted to the Environmental Impact Evaluation System (Sistema de Evaluación de Impacto Ambiental, SEIA): 13 in electricity generation, and 1 for electricity transmission and 3 about oil and gas energy project. Meanwhile, those already being evaluated represent a total investment of **USD 21,244 million.** In addition, **12** projects related to the energy sector obtained favorable environmental qualification resolutions (*Resolución de Calificación Ambiental*, or RCA) in **November**, and of those, 5 were for electricity generation projects, 5 were for high-voltage electricity transmission line projects and 2 were oil and/or gas energy projects.

Finally, among the most important policy issues that occurred during the month of November, its important to highlight, the draft law which establishes new systems for power transmission and make an **independent coordinator organization for the national electricity system**, together with the establishment by the Senate, for a period of indications to the draft law amending the General Law on electrical Services, to introduce mechanisms **for fairness in electricity rates.** It is also important to consider the publication in the Official Journal, the DS 2015 No. 16T Fixing Prices Knot Proenvironment in the Central Interconnected System and Norte Grande Interconnected System, on the occasion of fixations of pressures identified in Article 158 ° of the General Law of Electrical Services, Ministry of Energy .

Contents

ELECTRICITY SECTOR

1 Electricity Generation Projects Under Construction

As indicated in Article 31 of the Node Price Setting Regulation (0586/2012), "installations under construction" are defined as generation units, transmission lines and electrical substations that have been granted the respective construction permits for civil works or have been granted the order to proceed in the fabrication and/or installation of the corresponding electrical or electromagnetic equipment for electricity generation, transmission or transformation. For more information about NCRE projects, please go to the CIFES Monthly Energy Report

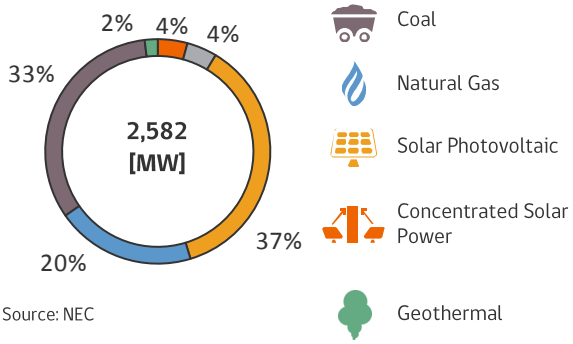
According to Exempt Resolution Num. 632/2015, "Works under Construction Update and Report," as of December 2th there were **32** power generation projects under construction in the SING. Together they represent capacity of **2,582 MW** and are projected to begin operation between December 2015 and February 2018.

Projects under Construction in the SING

Category	Date	Proyect Name	Region	Technology	Capac. [MW]
NCRE	dic-15	Andes Solar	II Región	Solar Photovoltaic	21
	dic-15	PMGD Pica I	I Región	Solar Photovoltaic	1
	dic-15	Jama Etapa II	II Región	Solar Photovoltaic	23
	dic-15	Pampa Camarones I	XV Región	Solar Photovoltaic	6
	ene-16	PV Cerro Dominador	II Región	Solar Photovoltaic	100
	feb-16	Finis Terrae I	II Región	Solar Photovoltaic	69
	abr-16	Arica Solar 1 (Etapa I)	XV Región	Solar Photovoltaic	18
	abr-16	Arica Solar 1 (Etapa II)	XV Región	Solar Photovoltaic	22
	abr-16	Pular	II Región	Solar Photovoltaic	29
	abr-16	Paruma	II Región	Solar Photovoltaic	21
	may-16	Cerro Dominador	II Región	Cogeneration	110
	may-16	Bolero Etapa I	II Región	Solar Photovoltaic	42
	jun-16	Bolero Etapa II	II Región	Solar Photovoltaic	42
	jun-16	Finis Terrae II	II Región	Solar Photovoltaic	69
	jun-16	Quillagua I	II Región	Solar Photovoltaic	23
	jul-16	Uribe Solar	II Región	Solar Photovoltaic	50
	jul-16	Lascar Etapa I	II Región	Solar Photovoltaic	30
	jul-16	Lascar Etapa II	II Región	Solar Photovoltaic	35
	ago-16	Bolero Etapa III	II Región	Solar Photovoltaic	21
	oct-16	Blue Sky 1	II Región	Solar Photovoltaic	52
	oct-16	Blue Sky 2	II Región	Solar Photovoltaic	34
	oct-16	Bolero Etapa IV	II Región	Solar Photovoltaic	41
	oct-16	Sierra Gorda	II Región	Wind	112
	dic-16	Quillagua II	II Región	Solar Photovoltaic	27
	dic-16	Cerro Pabellón	II Región	Geothermal	48
	ene-17	Huatacondo	I Región	Solar Photovoltaic	98
	ago-17	Quillagua III	II Región	Solar Photovoltaic	50
	oct-17	Usya	II Región	Solar Photovoltaic	25
Thermoelectric	dic-15	Cochrane U1	II Región	Coal	236
	may-16	Cochrane U2	II Región	Coal	236
	may-16	Kelar	II Región	NLG	517
	feb-18	Infraestructura Energética Mejillones	II Región	Coal	375

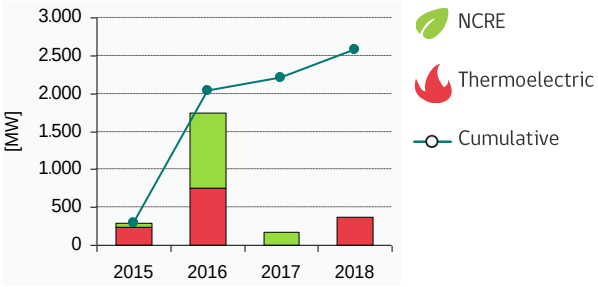
Source: NEC

Total under construction in the SING, by technology



Source: NEC

Projected operation start date, SING



Source: NEC

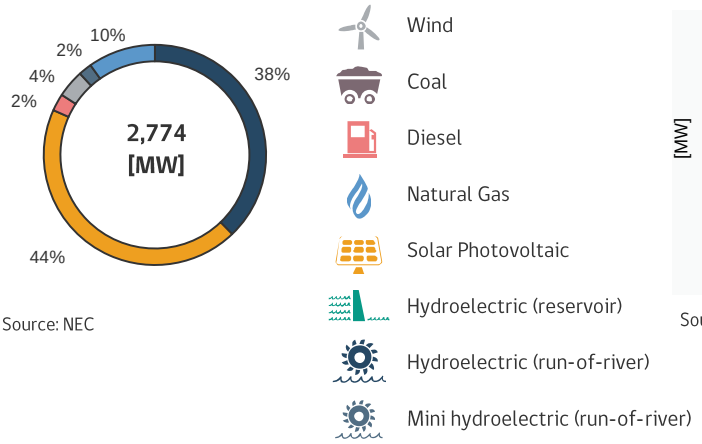
According to Exempt Resolution 632/2015, "Works under Construction Update and Report," as of December 2th there were **37** power generation projects under construction in the SIC. Together they represent capacity of **2,774 MW** and are projected to begin operation between December 2015 and October 2020.

Projects under Construction in the SIC

Category	Date	Proyect Name	Region	Technology	Capac. [MW]
NCRE	dic-15	Carilafquén	III Region	Mini hydroelectric (run-of-river)	20
	dic-15	Chaka Etapa I	III Region	Solar Photovoltaic	23
	dic-15	Chaka Etapa II	III Region	Solar Photovoltaic	27
	dic-15	La Montaña I	III Region	Mini hydroelectric (run-of-river)	3
	dic-15	Malalcahuello	III Region	Mini hydroelectric (run-of-river)	9
	dic-15	Panguipulli	III Region	Mini hydroelectric (run-of-river)	0
	dic-15	Carrera Pinto Etapa I	III Region	Solar Photovoltaic	20
	dic-15	Conejo Etapa I	III Region	Solar Photovoltaic	105
	dic-15	La Chapeana	III Region	Solar Photovoltaic	3
	dic-15	Las Mollacas	III Region	Solar Photovoltaic	3
	ene-16	Renaico	III Region	Wind	88
	ene-16	Valleland	III Region	Solar Photovoltaic	67
	ene-16	Pampa Solar	III Region	Solar Photovoltaic	69
	feb-16	Quilapilun	III Region	Solar Photovoltaic	103
	mar-16	Los Buenos Aires	III Region	Wind	24
	mar-16	PFV Olmué	III Region	Solar Photovoltaic	144
	mar-16	Las Nieves	III Region	Mini hydroelectric (run-of-river)	7
	mar-16	La Silla	III Region	Solar Photovoltaic	2
	abr-16	Valle Solar	III Region	Solar Photovoltaic	74
	jun-16	Río Colorado	III Region	Mini hydroelectric (run-of-river)	15
	jun-16	Carrera Pinto Etapa II	III Region	Solar Photovoltaic	77
	jul-16	Pelícano	III Region	Solar Photovoltaic	100
	ago-16	Abasol	III Region	Solar Photovoltaic	62
	sep-16	El Romero	III Region	Solar Photovoltaic	196
	sep-16	Divisadero	III Region	Solar Photovoltaic	65
	ene-17	Guanaco Solar	III Region	Solar Photovoltaic	50
	abr-17	Malgarida	III Region	Solar Photovoltaic	28
Conventional Hydroelectric	jun-16	Ancoa	III Region	Hydroelectric (run-of-river)	27
	sep-16	La Mina	III Region	Hydroelectric (run-of-river)	34
	feb-18	Alto Maipo - Las Lajas	III Region	Hydroelectric (run-of-river)	267
	may-18	Alto Maipo - Alfalfal II	III Region	Hydroelectric (run-of-river)	264
	jun-18	Ñuble	III Region	Hydroelectric (run-of-river)	136
	dic-18	Los Cóndores	III Region	Hydroelectric (run-of-river)	150
	oct-20	San Pedro	III Region	Hydroelectric (run-of-river)	170
Thermoelectric	dic-15	CMPC Tissue	III Region	Natural Gas	22
	mar-16	Doña Carmen	III Region	Diesel	70
	jun-17	CTM-3*	III Region	Diesel	251

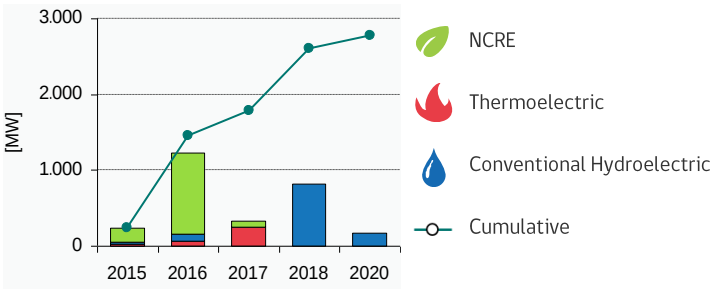
Source: NEC

Total under construction in the SIC, by technology



Source: NEC

Projected operation start date, SIC

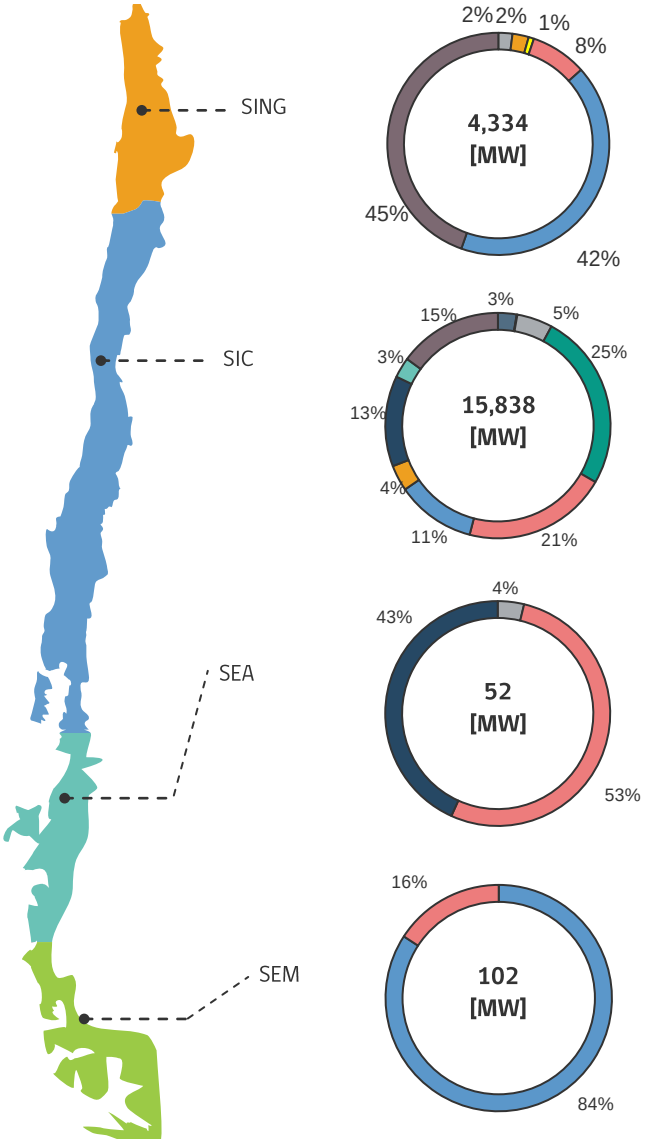


Source: NEC

2 Installed Electricity Generation Capacity

The installed electricity generation capacity as of November 2015 was **(*)20,337 MW**. Of that, **15,838 MW** (**77.9%**) corresponded to the SIC and **4,334 MW** (**21.3%**) to the SING. The remaining 0.8% was distributed among the Aysén and Magallanes electricity systems. As of May, **58.2%** of the country's total installed capacity is represented by thermoelectric generation, while **30.0%** is hydroelectric and **11.8%** is NCRE. For more information about NCRE projects, please go to the CIFES Monthly Energy Report

Installed Capacity by Technology



Source: CDEC-SIC / CDEC-SING and NEC

Installed capacity by system

System	Capacity [MW]	Capacity [%]
SING	4,334	21.3%
SIC	15,838	77.9%
SEA	52	0.3%
SEM	102	0.5%

Source: CDEC-SIC / CDEC-SING and NEC

Power generation plants in testing phase

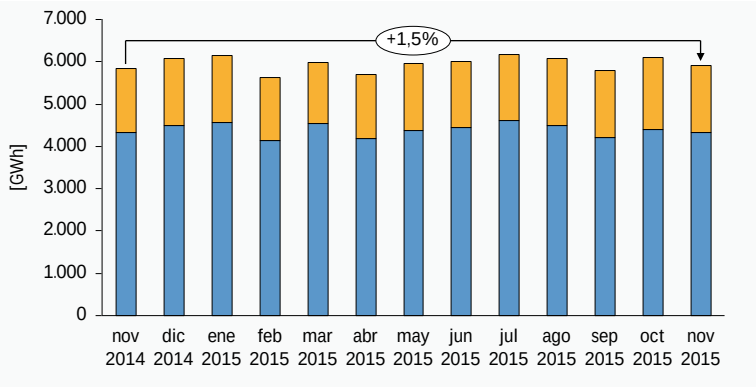
In addition to the total installed capacity, there are **16** synchronous power generation plants with their respective electricity systems that have not yet been approved for dispatch by the CDEC (in the testing phase). Of these, **13** plants are in the SIC (with a total capacity of **381.7 MW**) and **3** are in the SING (with a total capacity of **57.0 MW**). Thus, there is a total of **438.7 MW** in the testing phase.

* The total installed capacity also includes Los Lagos (6 MW) and Easter Island (4 MW) systems.

3 Electricity Generation

Power generation in the SIC during **November 2015** reached a total of **4,250 GWh**, which were classified as **19%** thermoelectric, **66%** conventional hydroelectric and **15%** NCRE. In the SING, **1,586 GWh** of electric power were generated, **95%** from thermoelectric plants and **5%** from NCRE. Together the systems reached a total of **5,836 GWh**, an decrease of **-3.3%** over the previous month and equal to November 2014. In resume, if we sort by generation category, we distinguish: **12.1%** NCRE, **48.0%** hydroelectric and **39.9%** thermoelectric generation.

Evolution of gross electric power generation, SIC-SING



Source: CDEC-SIC / CDEC-SING

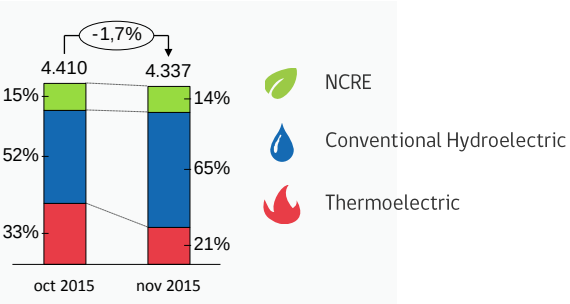
Evolution of gross electric power generation, SIC-SING

Energy Generation [GWh]	Monthly		Annual	
Total	5,923	-2.8%		1.5%
SING	1,586	-5.8%		5.3%
SIC	4,337	-1.7%		0.2%

Source: CDEC-SIC / CDEC-SING

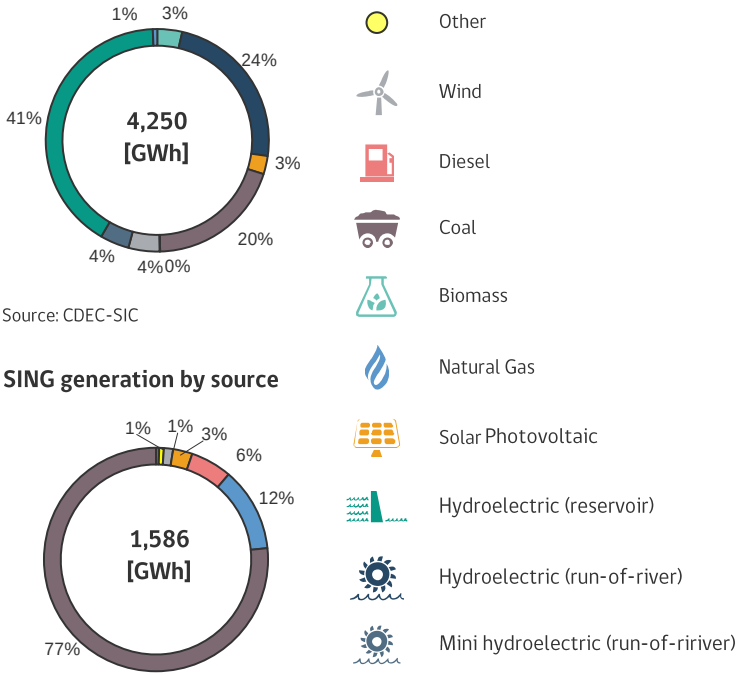
Following is a breakdown of power generation by technology in the SIC and SING.

Monthly Variation in Generation, SIC



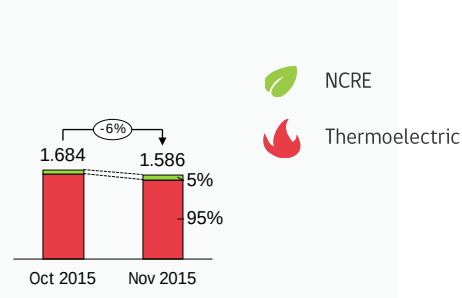
Source: CDEC-SIC

SIC generation by source



Source: CDEC-SIC

Monthly Variation in Generation, SING



Source: CDEC-SIC

SING generation by source

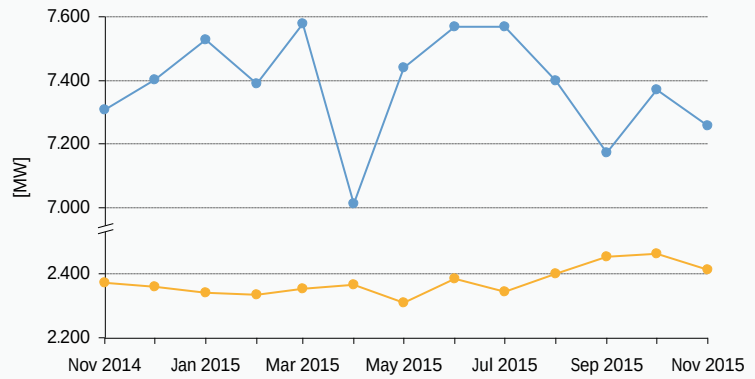
Source: CDEC-SIC

For more information about NCRE projects, please go to the CIFES Monthly Energy Report

4 Maximum Hourly Demand

The maximum hourly demand recorded on November 30th in the SIC was **7,257 MW**, similar to the demand recorded in the previous month and to November 2014. In the SING, the maximum hourly demand recorded on November 2th was **2,412MW**, which represented a **-2.1%** decrease over the maximum hourly demand recorded in the previous month and a **1.7%** increase over the same month of 2014.

Evolution of maximum hourly demand, SIC – SING



Source: CDEC – SIC / CDEC – SING

Variation in maximum hourly demand, by system

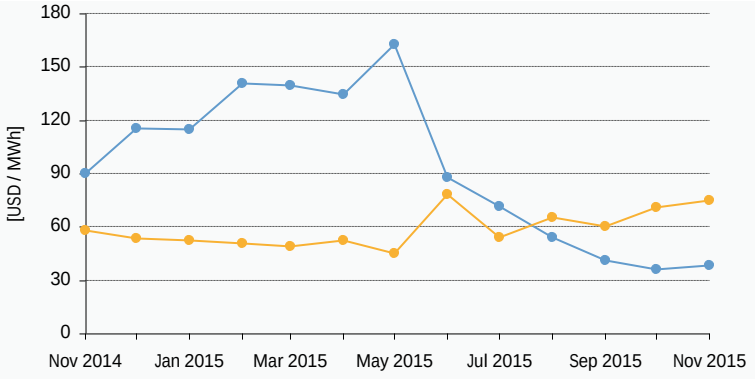
System	[MW]	Monthly	Annual
SIC	7,257	-1.6%	-0.7%
SING	2,412	-2.1%	1.7%

Source: CDEC – SIC / CDEC – SING

5 Marginal Costs

The marginal cost is the variable cost of the most expensive generation unit operating at a specific point in time. In this case, the Quillota 220 kV busbar was used as the reference to obtain the marginal cost in the SIC while the Crucero 220 kV busbar was used as the reference in the SING. The value given for each system corresponds to the monthly average of hourly marginal costs. In November, the average marginal cost in the SIC was **38.0 USD/MWh**, **5.9%** higher than the previous month and **-57.7%** lower than November 2014. In the SING, the average marginal cost was **72.7 USD/MWh**, **2.2%** more than he previous month and **25.4%** from November 2014.

Evolution of marginal costs, SIC – SING



Source: CDEC – SIC / CDEC – SING

Variation in marginal costs, SIC – SING

System	[USD/MWh]	Monthly	Annual
SIC	38.0	5.9%	-57.7%
SING	72.7	2.2%	25.4%

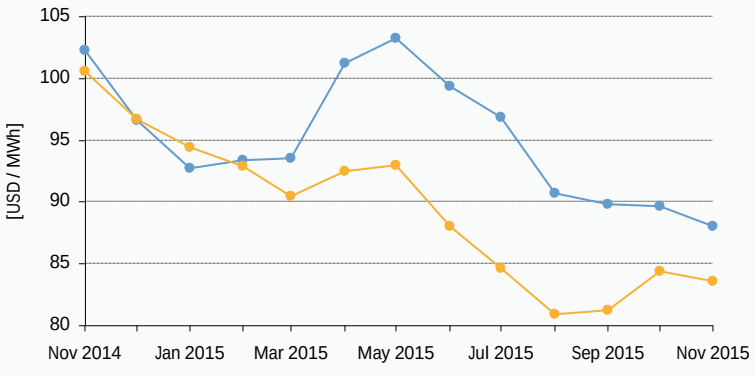
Source: CDEC – SIC / CDEC – SING

6 Average Market Price

The average market price (AMP) for each system is based on the average price of free customer contracts and long-term supply contracts held by distribution companies as applicable, reported to the National Energy Commission by the distribution companies operating in the Norte Grande Interconnected System and the Central Interconnected System. The AMP calculation takes into consideration a four-month window ending with the third month prior to the AMP publication date.

The AMP recorded in May for the SIC was **88.0 USD/MWh**, **-1.8%** lower than the previous month and **-13.9%** than November 2014. The AMP in the SING was **83.5 USD/MWh**, **-1.0%** more than the previous month and **-16.9%** lower than the same month in 2014.

Evolution of market prices, SIC – SING



Source: CDEC – SIC / CDEC – SING

Variation in average market prices, by system

System	[USD/MWh]	Monthly	Annual
SIC	88.0	-1.8%	-13.9%
SING	83.5	-1.0%	-16.9%

Source: CDEC – SIC / CDEC – SING

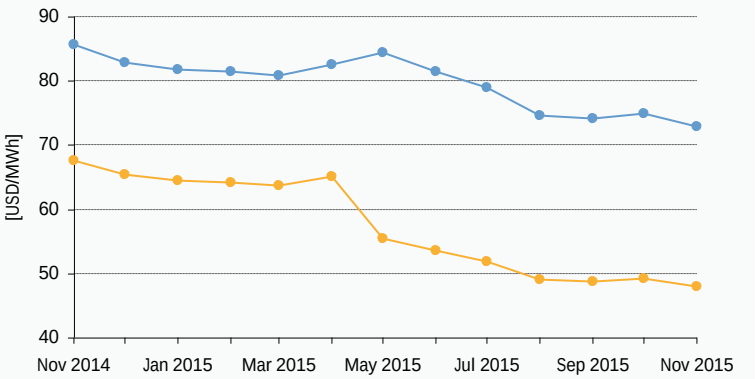
7 Short-term Node Prices

Short-term node prices are set twice each year, in May and October. These prices may be indexed monthly, depending on the conditions established in the twice-yearly decree that sets node prices for electricity supply. The prices are calculated by the National Energy Commission (NEC) which submits a technical report with the results to the Energy Ministry. The ministry then proceeds to set the prices via a decree published in the Official Bulletin.

Node Energy Price

The node energy price is the average over time of the marginal cost of energy in the electricity system operating at the minimum, updated operation and rationing cost. The node energy price in the SIC in November was **72.9 USD/MWh**, decreased in **-2.7%** compared to the previous month and **-15.0%** to the same month in 2014. In the SING, the node energy price in November was **47.9 USD/MWh**, with a **-2.7%** variation from the previous month and **-29.1%** of decrease compared to last year.

Evolution of node energy prices, SIC – SING



Source: NEC

Variation in node energy prices, by system

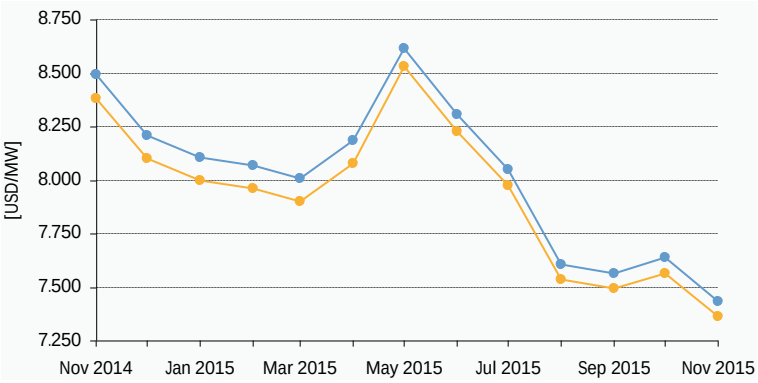
System	[USD/MWh]	Monthly	Annual
PNE SIC	72.9	-2.7%	-15.0%
PNE SING	47.9	-2.7%	-29.1%

Source: NEC

Node Power Price

The node power price is the annual marginal cost of increasing the installed capacity of the electricity system taking into consideration the most economic generation plants, required to supply additional capacity during the annual maximum hourly demand of the electricity system, increased by a percentage equal to the theoretical capacity reserve margin of the system. The node power price in the SIC in **November** was **7,433 USD/MW**, decreased on **-2.7%** compared to the previous month and **-12.5%** lower than the same month in 2014. In the SING, the node power price in **November** was **7,364 USD/MW**, with **-2.7%** variation from the previous month and **-12.1%** of decrease compared to last year.

Evolution of node power price, SIC – SING



Source: CNE

Variation in node power price

System	[USD/MW]	Monthly	Annual
PNP SIC	7,433	-2.7%	-12.5%
PNP SING	7,364	-2.7%	-12.1%

Source: CNE

8 Node Price in Medium-size Systems

Below we present the node energy price and node power price in medium-size systems for November 2015. These node prices are applied to energy supply at the withdrawal busbars indicated in the following tables:

Variation in node energy price, medium-size systems

Busbar	[USD/MWh]	Index	Annual
Pta Arenas	61	4.4%	3.1%
Tres Puentes	61	4.2%	5.7%
Pto Natales	89	6.2%	5.1%
Porvenir	83	6.2%	11.3%
Pto Williams	280	0.5%	6.3%
Aysén 23	86	0.5%	-11.8%
Chacab23	86	0.5%	-11.7%
Mañi23	86	0.5%	-11.7%
Ñire33	86	5.0%	-11.7%
Tehuel23	86	-1.4%	7.2%
Palena	84	5.5%	-18.8%
G.Carrera	113	5.0%	8.8%
Cochamó	180	4.0%	-13.3%
Hornopirén	157	0.0%	6.4%

Source: CNE

Variation in node power price, medium-size systems

Busbar	[USD/MW-mth]	Index	Annual
Pta Arenas	14,900	6.2%	11.3%
Tres Puentes	14,900	6.2%	11.3%
Pto Natales	8,327	6.0%	9.7%
Porvenir	10,422	5.0%	8.2%
Pto Williams	19,712	4.0%	6.3%
Aysén 23	10,979	5.5%	8.8%
Chacab23	10,979	5.5%	8.8%
Mañi23	10,979	5.5%	8.8%
Ñire33	10,979	5.5%	8.8%
Tehuel23	10,979	5.5%	8.8%
Palena	15,466	5.0%	8.0%
G.Carrera	20,960	4.0%	6.4%
Cochamó	20,663	4.0%	6.4%
Hornopirén	13,260	0.0%	0.0%

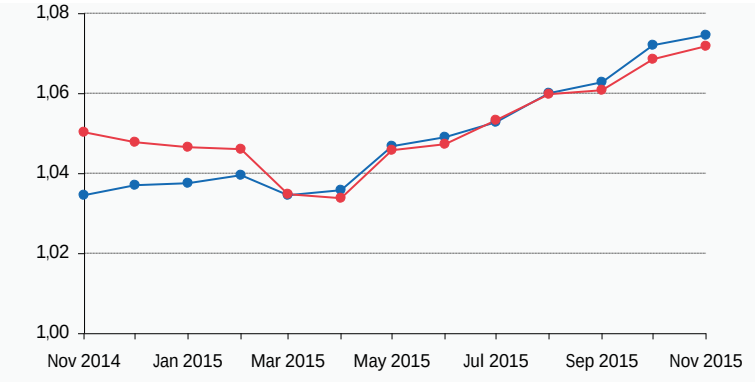
Source: CNE

9 Evolution of Variable Distribution Cost Indexes

The distribution added value (DAV)* is set every four years by the Energy Ministry, based on a technical report prepared by the NEC, and corresponds to the average cost of investment, administration, maintenance and operation of electricity distribution networks calculated for an efficient model company operating in Chile. The DAV has a fixed component and a variable component, both of which were established by Article 182 of the General Electrical Services Law and are indexed monthly. Below we provide the evoluation of the indexator of the variable component both for high and low voltage for November 2015.

For more information, visit Decreto N°1T/2012 Proceso de Fijación de Tarifas de Distribución 2012-2016.

Evolution of Indexes



Source: CNE

Variation in Indexes

System	Index	Monthly	Annual
CDAT	1.074	0.2%	3.9%
CDBT	1.072	0.3%	2.1%

Source: CNE

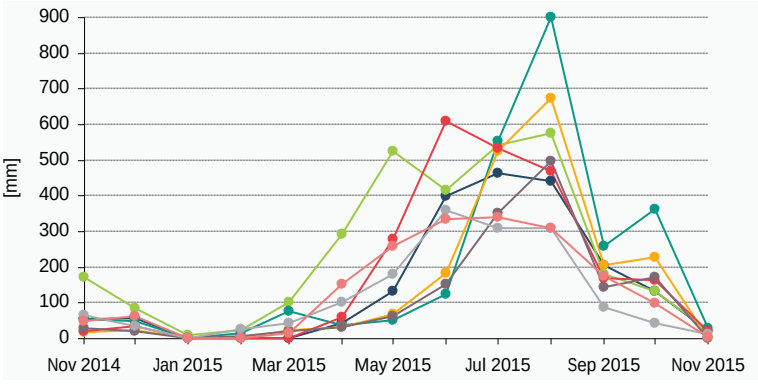
10 Hydrological Statistics

Because of the hydro-thermal nature of the Central Interconnected System, which features large hydroelectric (reservoir) plants with for regulation in different periods of time and thermal plants (as well as other technologies), the use of reservoir water must be optimized in order to minimize the total cost of supplying the system. For this reason, we provide information below from monitoring and recording the important variables associated with hydrology, such as rainfall, and the operational status of infrastructure of the hydroelectric plants in relation to the respective reservoir levels and volumes.

Rainfall Statistics

The monthly rainfall statistics published by CDEC-SIC and updated as of November 30, 2015 are shown below for the main measurement locations.

Evolution of Annual Rainfall



Source: CDEC—SIC

Variation in Annual Rainfall

Reservoir	[mm]	Monthly	Annual
Abanico	20	-85%	-63%
Canutillar	22	-84%	-87%
Others (**)	27	-92%	-48%
Colbún	0	-100%	-100%
Pangue	19	-88%	-2%
Pehuenche	0	-100%	-99%
Pilmaiquén	10	-76%	-84%
Pullinque	4	-96%	-92%

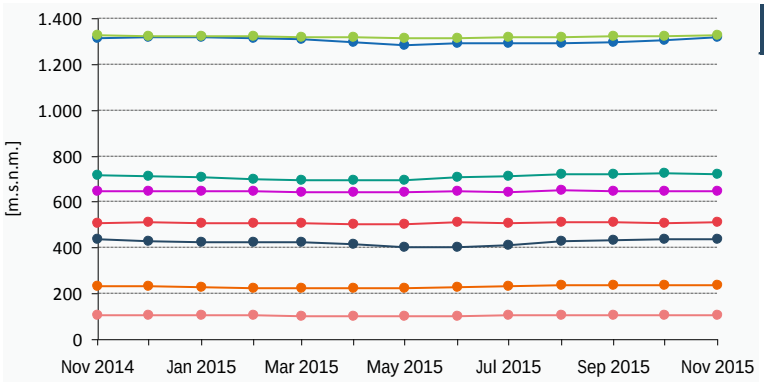
(*) The relative weight in a type BT1a account with a monthly consumption of 150kWh is 26.97% in the SIC and SING 22.95%.

(**) Other: Sauzal, Cypress, Molles, Rapel.

Reservoir, Lake and Lagoon Levels

According to information submitted by the CDEC-SIC, in November the final levels were found for the following reservoirs, lakes and lagoons:

Evolution of Reservoir Levels



Source: CDEC—SIC

Variation in Reservoir Levels

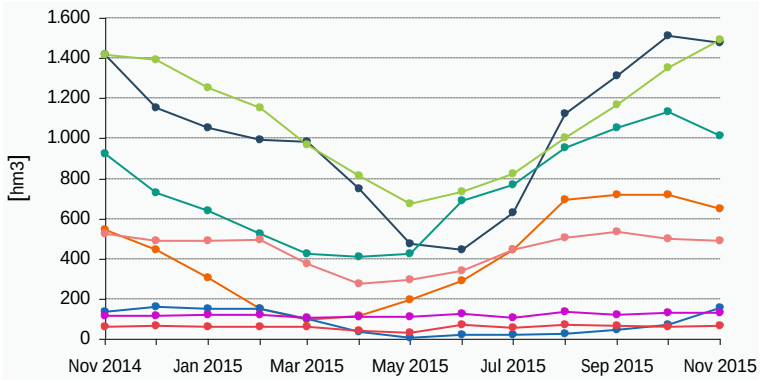
Reservoir	[m.s.n.m.]	Monthly	Annual
CHAPO	234	-0.6%	1.0%
COLBUN	435	-0.2%	0.3%
LA INVERNADA	1,315	1.0%	0.2%
LAJA	1,325	0.1%	0.1%
MELADO	647	0.0%	0.5%
PANGUE	508	0.1%	0.2%
RALCO	720	-0.5%	0.4%
RAPEL	104	-0.1%	-0.4%

Source: CDEC—SIC

Reservoir, Lake and Lagoon Volumes

Based on levels reported by the CDEC-SIC for volumes of water stored in the largest reservoirs, lakes and lagoons, considering the characteristics of each one as of November 2015.

Evolution of Reservoir Volume



Source: CDEC—SIC

Variation in Reservoir Volume

Reservoir	[hm3]	Monthly	Annual
CHAPO	716	-0.3%	31.7%
COLBUN	1,512	15.5%	6.8%
LA INVERNADA	72	65.5%	-46.0%
LAJA	1,350	15.7%	-4.5%
MELADO	128	7.2%	11.1%
PANGUE	61	-5.9%	5.2%
RALCO	1,131	7.7%	22.6%
RAPEL	498	-6.4%	-4.3%

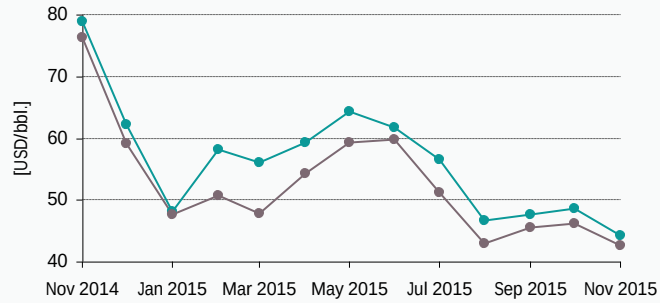
Source: CDEC—SIC

OIL AND GAS SECTOR

1 International Fuel Market Prices

The following information details the moving year evolution of the West Texas Intermediate (WTI) crude oil price index, which is used as a reference in the U.S. market, along with the BRENT oil price index which reflects oil prices for European markets. In **November 2015**, BRENT oil prices averaged **44.3 USD/bbl**., which represents an **-8.8%** decrease from the previous month but a **-43.9%** increase from November 2014. Meanwhile, the average WTI oil prices was **42.6 USD/bbl**, a **-7.7%** decrease from the previous month but a **-44.1%** decrease from the same month the previous year.

Evolution of BRENT and WTI Oil Prices



Source: NEC, based on data from Argus Media Inc.

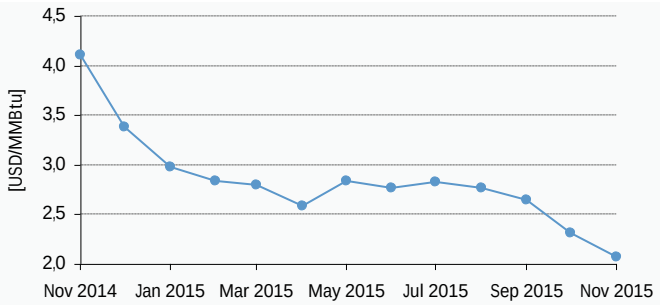
Crude Oil Variation (USD/bbl.)

Index	USD/bbl.	Monthly	Annual
BRENT DTD	44.3	-8.8%	-43.9%
WTI	42.6	-7.7%	-44.1%

Source: NEC, based on data from Argus Media Inc.

The following information details the evolution of the Henry Hub (Louisiana) price index, which serves as a reference for liquefied natural gas (LNG) imports to Chile. In **November**, Henry Hub averaged **2.08 USD/MMBtu**, an **-10.5%** decrease from the previous month and a **-49.5%** decrease compared to **November 2014**.

Evolution of Natural Gas Price (Henry Hub)



Source: NEC, based on data from the Daily Gas Price Index, NGI Intelligence

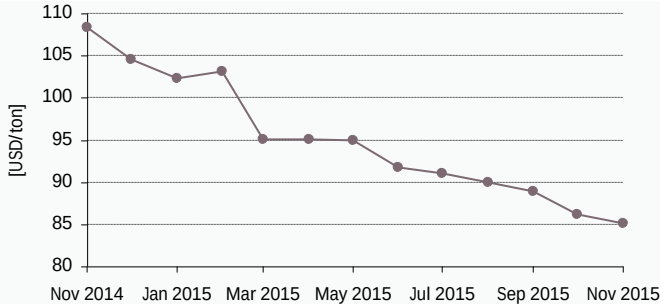
Natural Gas Variation (Henry Hub)

Index	USD/MMBtu	Monthly	Annual
HENRY HUB SPOT	2.08	-10.5%	-49.5%

Source: NEC, based on data from the Daily Gas Price Index, NGI Intelligence

The following information details the evolution of the price of EQ 7000 steam coal kCal/kg which in November averaged a price of **85.1 USD/ton**, , representing an **-1.3%** decrease over the previous month and a **-21.5%** decrease from the same month in **2014**.

Evolution of EQ 7000 Steam Coal kCal/kg



Source: NEC, based on data from Platts Coal Trader International

Variation in EQ 7000 Steam Coal kCal/kg

Index	USD/ton	Monthly	Annual
THERMAL COAL EQ. 7.000 KCAL/KG	85.1	-1.3%	-21.5%

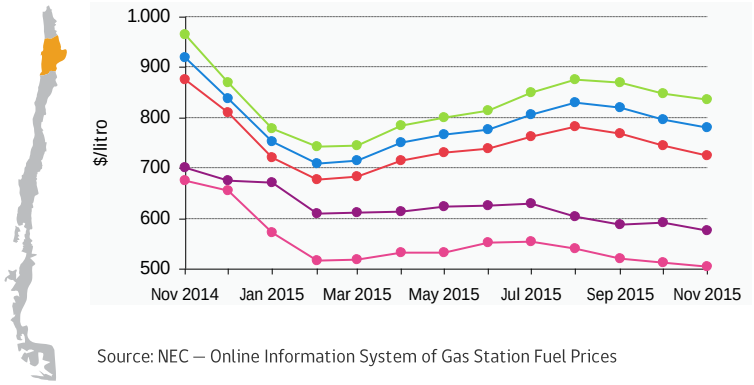
Source: NEC, based on data from Platts Coal Trader International

2 Domestic Liquid Fuel Prices

The following information details the evolution of different types of petroleum-derived liquid fuels sold or commercialized at gas stations (93-, 95-, and 97-octane unleaded gas, diesel, household kerosene and diesel oil) during the last 12 months, along with the average monthly price in last month for the cities of Antofagasta, Concepción, Puerto Montt and the Santiago Metropolitan Region.
The information presented is prepared by the National Energy Commission which, as part of its legal functions and powers, developed the Online Information System of Gas Station Fuel Prices, www.bencinaenlinea.cl

Antofagasta

Evolution of Liquid Fuel Prices



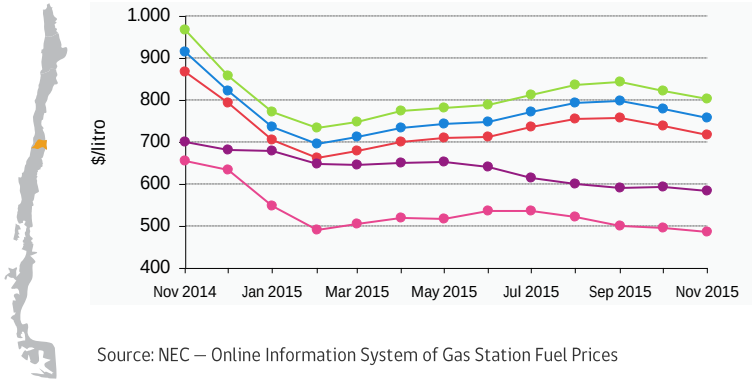
Source: NEC — Online Information System of Gas Station Fuel Prices

Variation of Liquid Fuel Prices

Fuel Type	$/liter	Monthly	Annual
Gasoline 93 SP	725	-2.6%	-17.2%
Gasoline 95 SP	781	-2.0%	-15.1%
Gasoline 97 SP	835	-1.4%	-13.4%
Kerosene	575	-2.7%	-18.0%
Diesel	503	-1.8%	-25.4%

Source: NEC — Online Information System of Gas Station Fuel Prices

Santiago Metropolitan

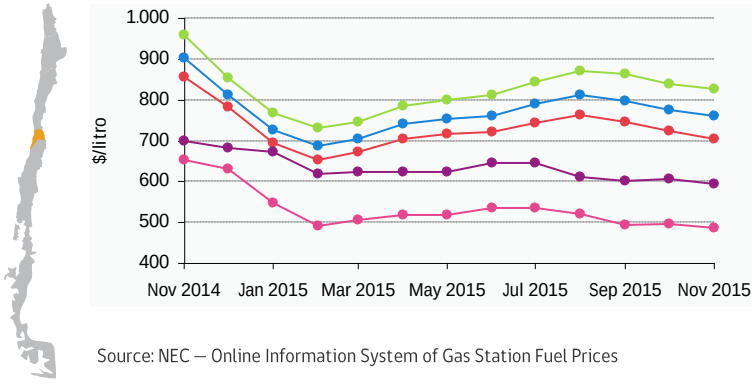


Source: NEC — Online Information System of Gas Station Fuel Prices

Fuel Type	$/liter	Monthly	Annual
Gasoline 93 SP	718	-2.7%	-17.2%
Gasoline 95 SP	757	-2.6%	-17.2%
Gasoline 97 SP	803	-2.3%	-16.9%
Kerosene	583	-1.9%	-16.7%
Diesel	485	-2.0%	-26.1%

Source: NEC — Online Information System of Gas Station Fuel Prices

Valparaíso



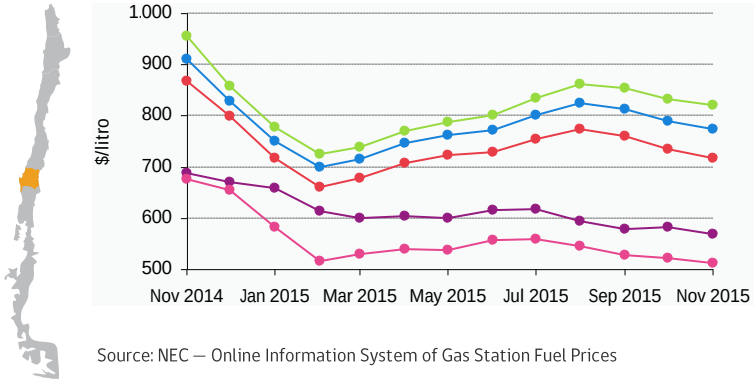
Source: NEC — Online Information System of Gas Station Fuel Prices

Fuel Type	$/liter	Monthly	Annual
Gasoline 93 SP	703	-2.7%	-17.7%
Gasoline 95 SP	760	-2.0%	-15.7%
Gasoline 97 SP	826	-1.4%	-13.8%
Kerosene	593	-2.1%	-15.1%
Diesel	486	-1.8%	-25.6%

Source: NEC — Online Information System of Gas Station Fuel Prices

Evolution of Liquid Fuel Prices

Concepción



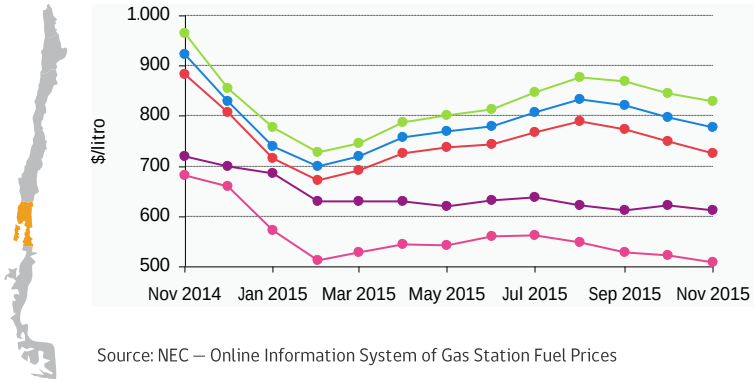
Source: NEC — Online Information System of Gas Station Fuel Prices

Variation of Liquid Fuel Prices

Fuel Type	$/liter	Monthly	Annual
Gasoline 93 SP	716	-2.6%	-17.4%
Gasoline 95 SP	774	-2.0%	-14.9%
Gasoline 97 SP	820	-1.4%	-14.2%
Kerosene	568	-2.3%	-17.3%
Diesel	512	-1.7%	-24.2%

Source: NEC — Online Information System of Gas Station Fuel Prices

Puerto Montt



Source: NEC — Online Information System of Gas Station Fuel Prices

Fuel Type	$/liter	Monthly	Annual
Gasoline 93 SP	725	-3.2%	-17.9%
Gasoline 95 SP	777	-2.5%	-15.8%
Gasoline 97 SP	829	-1.9%	-14.1%
Kerosene	611	-1.6%	-15.0%
Diesel	509	-2.5%	-25.3%

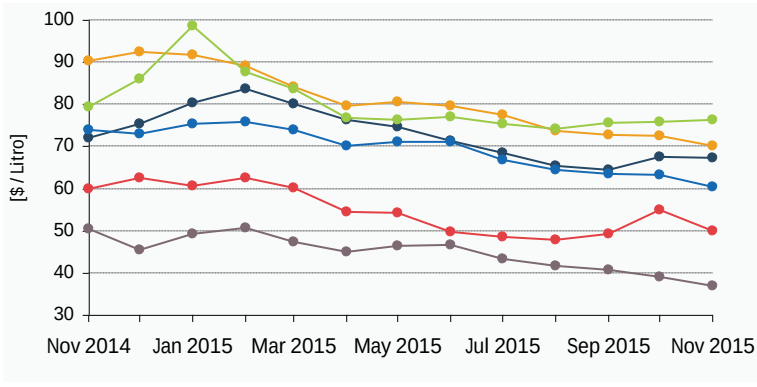
Source: NEC — Online Information System of Gas Station Fuel Prices

3 Fuel Gross Margins

The retail sales price of fuels is structured as follows: sales price at the refinery, sales margin and taxes (VAT and specific tax). The following information shows the evolution of the sales margin for 93-octane gas and diesel in the 5th, 6th, 7th, 8th, 12th and Santiago Metropolitan regions.

93-Octane Gasoline

Evolution of Gross Sales Margin



Source: CNE

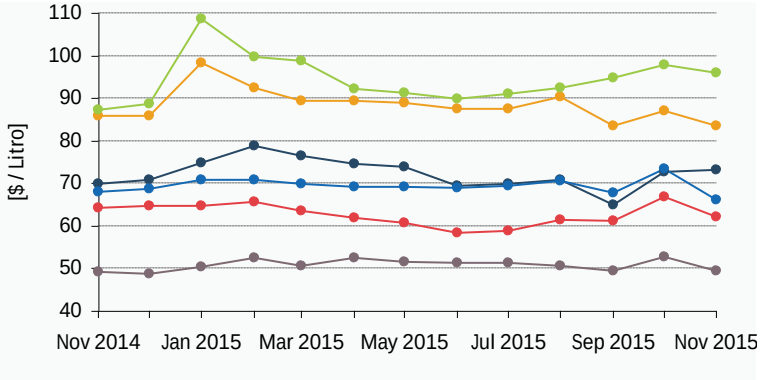
Variation in Gross Sales Margin

93-Octane Gas	$/liter	Monthly	Annual
5th Region	67	-0.4%	-6.4%
6th Region	70	-3.2%	-22.2%
7th Region	60	-4.6%	-18.3%
8th Region	76	0.5%	-3.9%
Santiago Metropolitana	50	-8.9%	-16.5%
12th Region	37	-5.1%	-26.7%

Source: CNE

Diesel

Evolution of Gross Sales Margin



Source: CNE

Variation in Gross Sales Margin

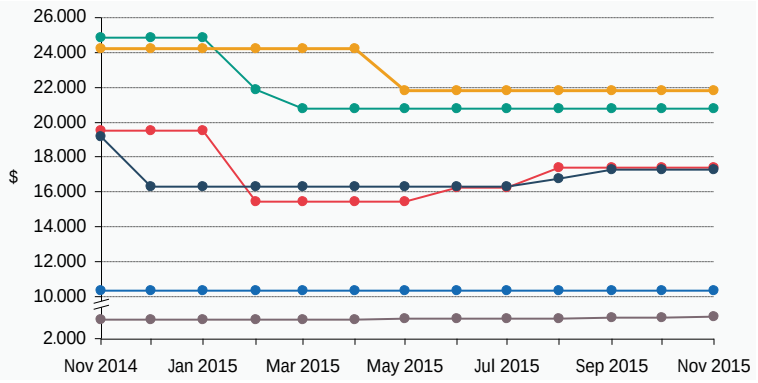
Diesel Oil	$/liter	Monthly	Annual
5th Region	73	0.6%	4.7%
6th Region	83	-3.9%	-2.6%
7th Region	66	-10.1%	-2.8%
8th Region	96	-1.9%	9.9%
Santiago Metropolitana	62	-6.9%	-3.3%
12th Region	49	-6.1%	0.2%

Source: CNE

4 Domestic Prices of Network Gas Supplied through Concessions

The following information shows the price based on the energy equivalence of natural gas, city gas or propane air, whichever is applicable, distributed to the end consumer as network gas under concession equivalent to 15-kg cylinders of liquified petroleum gas. This price also includes fixed costs and meter rental, charged by the network gas distribution companies when applicable.

Evolution of Network Gas Prices



Source: NEC — Online Gas Price System

Variation in Network Gas Prices

Company (Region)	$	Monthly	Annual
Lipigas (2th)	10.312	0.0%	0.0%
Gasvalpo (5th)	17.419	0.0%	-10.9%
Metrogas (Metropolitana)	17.274	0.0%	-9.8%
Gassur (8th)	20.793	0.0%	-16.3%
Intergas (8th)	21.792	0.0%	-10.0%
Gasco Magallanes (9th)	3.251	0.9%	4.7%

Source: NEC — Online Gas Price System

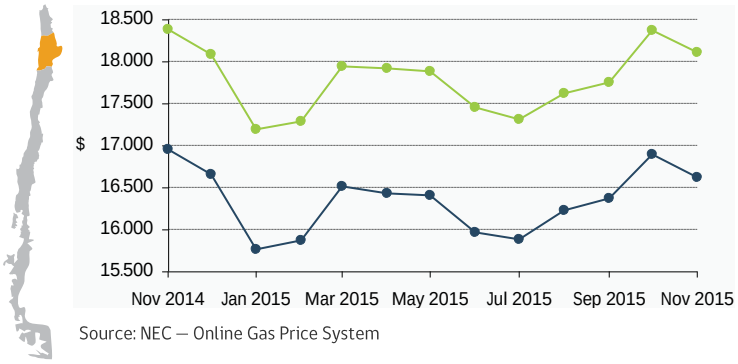
5 Domestic Prices of Bottled Liquefied Petroleum Gas

Bottled LPG is liquefied gas fuel, i.e., propane and butane and their blends (with a maximum 30% of butane). The fuel is compressed for bottling in cylinders of varying sizes that are sold to end users for use in heaters, stoves and water heaters/boilers. The cylinders on the local market have a capacity of 2 kg, 5 kg, 11 kg, 15 kg and 45 kg. They are also sold according to quality; one is sold as normal or regular and the other as catalytic, a category required by some heating appliances that only use a fuel with a low content of olefins, diolefins and sulfur. The information below shows the evolution of the average price of bottled LPG in 15-kg cylinders for the cities of Antofagasta, Concepción, Puerto Montt and the Santiago Metropolitan Region.

Evolution of Bottled LPG Prices

Variation in Bottled LPG Prices

Antofagasta

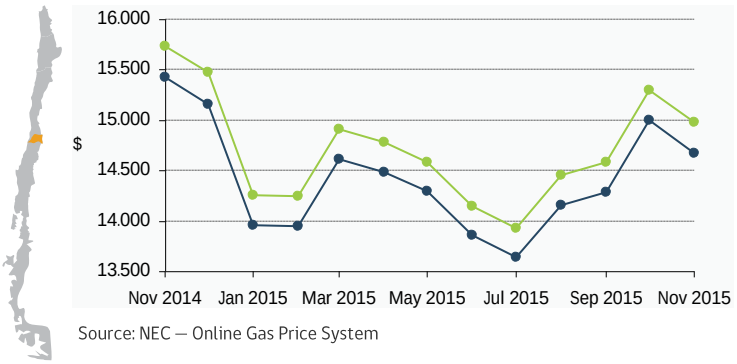


Source: NEC — Online Gas Price System

Type	$	Monthly	Yearly
Catalityc	18,105	-1.4%	-1.5%
Regular	16,620	-1.6%	-1.9%

Source: NEC — Online Gas Price System

Santiago Metropolitan

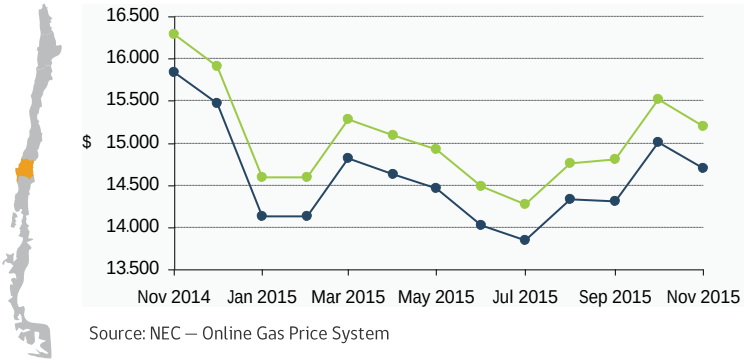


Source: NEC — Online Gas Price System

Type	$	Monthly	Yearly
Catalityc	14,978	-2.1%	-4.8%
Regular	14,674	-2.1%	-4.8%

Source: NEC — Online Gas Price System

Concepción



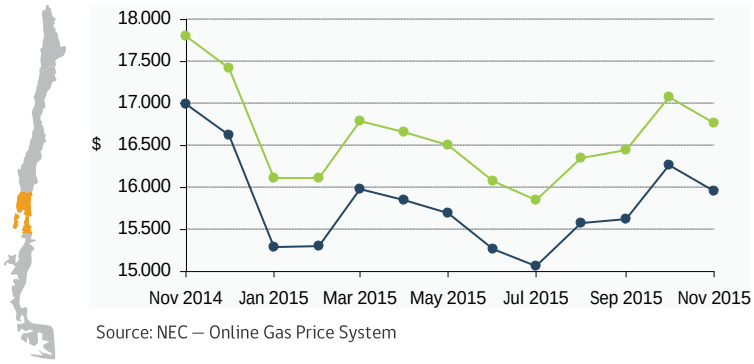
Source: NEC — Online Gas Price System

Type	$	Monthly	Yearly
Catalityc	15,197	-2.0%	-6.7%
Regular	14,693	-2.1%	-7.2%

Source: NEC — Online Gas Price System

Evolution of Bottled LPG Prices

Puerto Montt



Source: NEC — Online Gas Price System

Variation in Bottled LPG Prices

Type	$	Monthly	Yearly
Catalityc	16,760	-1.9%	-5.8%
Regular	15,953	-1.9%	-6.1%

Source: NEC — Online Gas Price System

6 Fuel imports and exports

Information on imports and exports of primary and secondary fuels corresponds to **October 2015** given that the official information source has a two-month time lag. The information on imports mainly applies to coal, crude oil, diesel and natural gas, equivalent to more than 89% of total national imports (in tons) for October 2015.

The total variation of imports registered a decrease of -7.9% over the previous month and -13.0% compared to October 2014. Meanwhile, the total change in exports recorded a considerable increase compared to the previous month but are higher than October 2014. The main fuel exported during the month of October was IFO representing 36% of total exports in tons.

Imports of the main primary fuels during the month of October are coal from Colombia and the United States; crude oil from Brazil and Ecuador; diesel from the United States and Japan; and liquefied natural gas brought from Trinidad and Tobago..

During October the exports of diesel and gasoline recorded as country of destination Bolivia meanwhile the exported IFO went to Panamá.

Here are the details for each of the fuels with percentage changes and countries of origin / destination .

Variation in Imports During the Period

Fuel	[Thous-Tons]	Monthly	Annual
Coal	716	-21.9%	-18.9%
Crude Oil	545	-26.1%	-28.8%
Diesel Oil	450	59.1%	16.5%
Natural Gas	151	-14.0%	-32.4%
Gasoline	92	(**)	69.6%
LPG	88	2.7%	12.2%
Household Kerosene	38.8	64.3%	(*)
Overall total	2,081	-7.9%	-13.0%

Source: Aduana by COMEX (www.comexplusccs.cl)

Variation in Exports During the Period

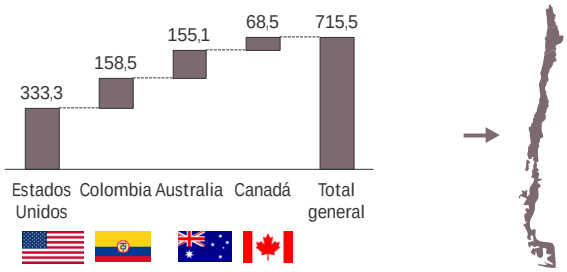
Fuel	[Thous-Tons]	Monthly	Annual
Coal	26	(*)	-92.0%
Diesel Oil	12	220.4%	-13.3%
Fuel Oil	22	(*)	(*)
Gasoline	8	(*)	41.1%
GLP	0	(**)	(**)
IFO	39	68.7%	(*)
Total	107	219%	-70%

Source: Aduana by COMEX (www.comexplusccs.cl)

(*) No transactions recorded during the period under review
(**) Not recorded during the reference month transactions

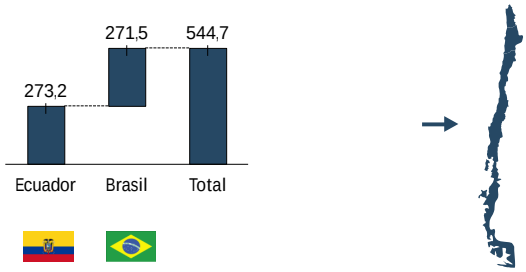
Imports by Country of Origin (thousands of tons)

Coal (*)



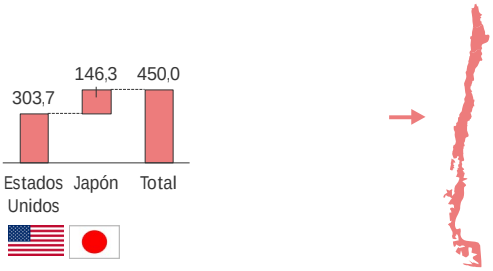
Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

Crude Oil



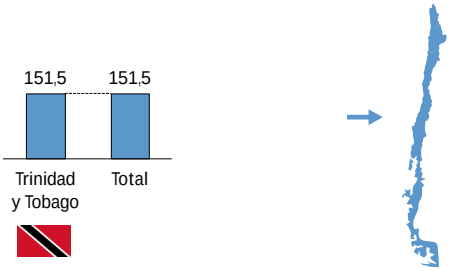
Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

Diesel Oil



Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

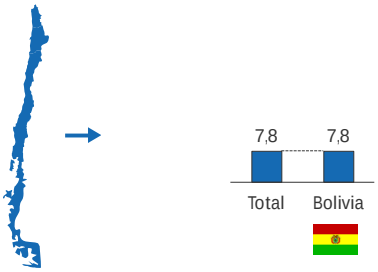
Natural Gas



Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

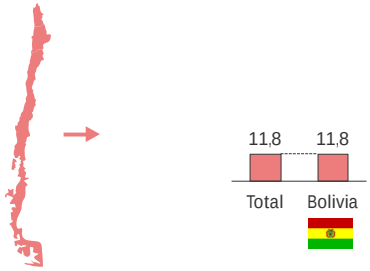
Exports by Country of Origin (thousands of tons)

Gasoline



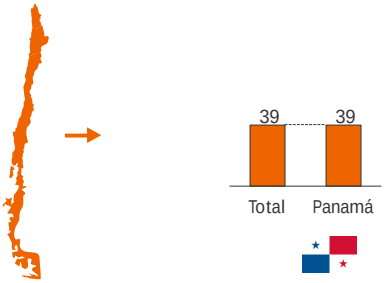
Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

Diesel Oil



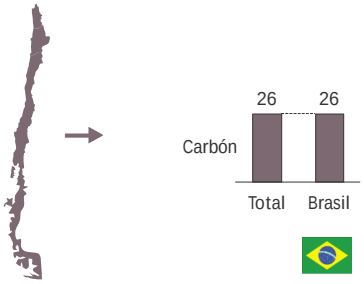
Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

IFO



Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

Coal

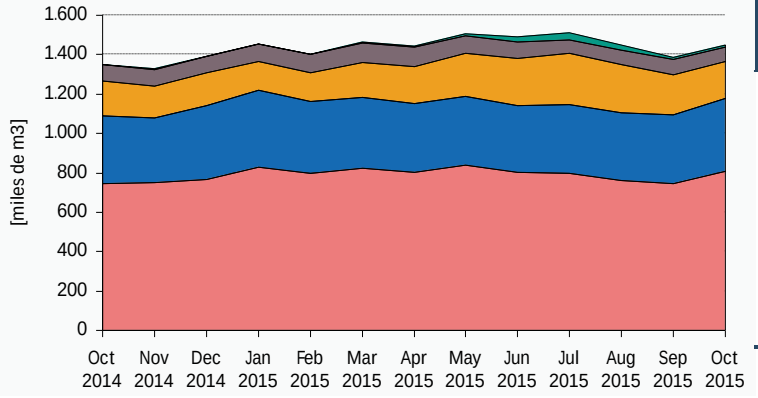


Source: Customs, provided by Comex Service, Santiago Chamber of Commerce

7 Fuel Sales

The following information details the evolution and the variation in the sales of the principal oil-based fuels. The information available is presented with a one-month time lag. The fuels analyzed are: domestic kerosene, fuel oils, liquefied gas, diesel oil and unleaded 93-, 95- and 97-octane gas.

Fuel Sales Evolution, by Type



Source: NEC, based on ENAP data

Fuel Sales Variation, by Type

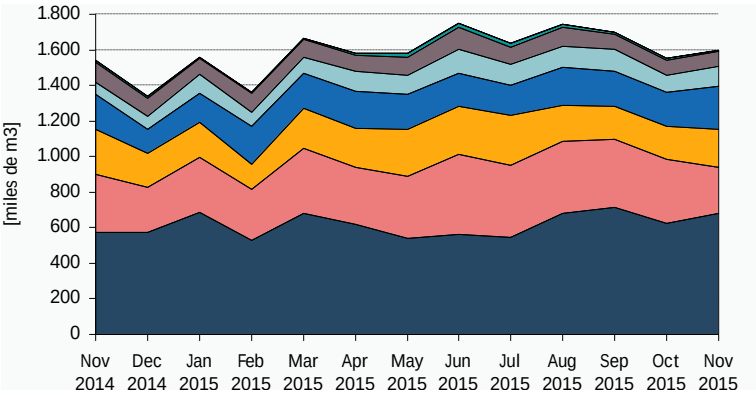
Type	[Thous - m3]	Monthly	Annual
Household kerosene	7	-12.5%	250.0%
Fuel Oils	75	-2.6%	-8.5%
Liquefied Gas	189	-6.4%	6.2%
Gasoline	369	4.5%	8.2%
Diesel Oil	808	8.6%	8.2%
Overall total	1,448	4.6%	7.3%

Source: NEC, based on ENAP data

8 Fuel Inventory

The following information presents monthly fuel inventory levels (aviation fuel, household kerosene, fuel oils, aviation kerosene, automotive gas, liquefied gas, diesel oil and crude oil) in thousands of m3 for the entire country. This value corresponds to the last business day of the respective month.

Fuel Inventory Evolution, by Type



Source: NEC

Fuel Inventory Evolution, by Type

Type	[Thous - m3]	Monthly	Annual
Aviation gas	1	214.7%	152.3%
Household K	5	-31.4%	-48.4%
Fuel Oils	88	-0.3%	-20.6%
Kerosene Av.	111	16.1%	57.1%
Automotive gas	244	29.9%	25.3%
Liquefied gas	212	14.1%	-15.5%
Diesel oil	256	-28.8%	-21.6%
Crudo oil	683	8.9%	18.5%
Overall total	1,600	3.1%	3.9%

Source: NEC

ENERGY PROJECTS UNDERGOING ENVIRONMENTAL EVALUATION

1 Projects Submitted for Environmental Evaluation

In November 2015, **17 energy projects** were submitted to the Environmental Impact Evaluation System (SEIA), representing an investment of **USD 886 million**. Of these, **13** projects are for electric power generation, **1** projects are for electrical transmission growth and **3** about Oil and/or gas energy project.

Detail of energy projects submitted for environmental evaluation

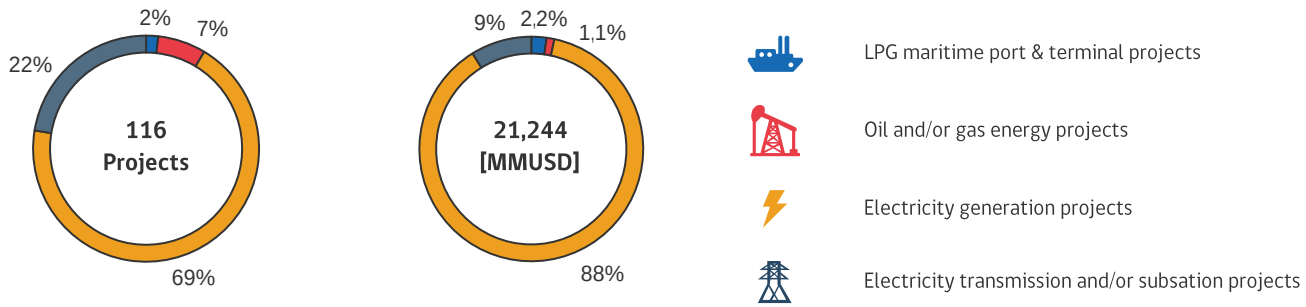
Project Type	Project Owner	Project Name	Presentation Date	Investment [MMUSD]	WEB
Generation	IMELSA S.A.	Central de Respaldo Doña Carmen	23-nov-15	43,0	Link
Generation	Amunche Solar SpA.	PARQUE SOLAR FOTOVOLTAICO LA CONSTITUCION	20-nov-15	100,0	Link
Generation	PRIME ENERGIA SPA	Central de Respaldo San Javier	23-nov-15	3,0	Link
Generation	PRIME ENERGIA SPA	Proyecto Central de Respaldo Combarbalá – 75 MW	20-nov-15	50,0	Link
Generation	GR Lingue SpA	Parque Solar Fotovoltaico Panquehue	23-nov-15	10,0	Link
Generation	Rihue SpA	Parque Eólico Rihue	20-nov-15	290,0	Link
Generation	HBS Gas Natural Licuado S.A.	Ampliación planta de generación eléctrica a base de GNL Los Ángeles	20-nov-15	0,6	Link
Generation	Fotovoltaica Los Andes SpA.	FOTOVOLTAICA LOS ANDES	20-nov-15	50,0	Link
Generation	PV Lilen SpA	PV Lilen	20-nov-15	150,0	Link
Generation	CHESTER SOLAR IV SpA	PARQUE SOLAR FOTOVOLTAICO EL ROBLE	19-nov-15	15,0	Link
Generation	PV LUMA SpA	PV LUMA 1	18-nov-15	13,5	Link
Generation	PV INTIMICHA SpA	PV LUMA 3	18-nov-15	19,5	Link
Generation	EL GATO HYDRO CHILE SPA	CENTRAL HIDROELECTRICA DE PASADA EL GATO	10-nov-15	30,5	Link
High-voltage electricity transmission line	TRANSELEC S.A.	LÍNEA ALTA TENSIÓN LO AGUIRRE-CERRO NAVIA 2X220 kV "MODERNIZACIÓN SISTEMA TRANSMISIÓN"	25-nov-15	100,0	Link
Oil and/or gas energy projects	Empresa Nacional del Petróleo - Magallanes	Colectores del Bloque Arenal	18-nov-15	7,9	Link
Oil and/or gas energy projects	Empresa Nacional del Petróleo - Magallanes	LÍNEAS DE FLUJO PAD CABAÑA OESTE ZGC, PAD CABAÑA OESTE ZGD Y POZO ARAUCANO 1	18-nov-15	1,2	Link
Oil and/or gas energy projects	GeoPark Fell SpA	Optimización de la producción de los pozos Santiago Norte 2, Santiago Norte 4, Nika Oeste 3 y Dicky 18	23-nov-2015	2,0	Link

Source: SEIA

2 Energy Projects Currently Being Evaluated

In November 2015, there were **116** energy projects awaiting approval of their environmental qualification resolutions (RCA). Of these, 68% are projects related to electric power generation, and the remaining are mixed projects. Together they represent a total investment of **21,244 MMUSD.**

Distribution of Projects and their Investment [millions of USD]



Source: SEIA

3 Projects with Approved Environmental Qualification Resolution

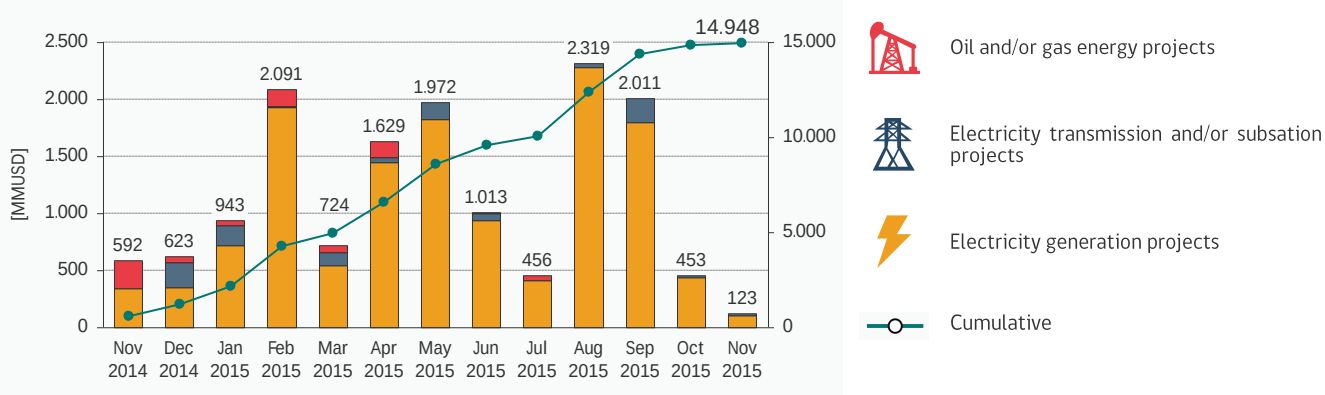
In **November 2015**, the environmental qualification resolutions (RCA) of **12** energy projects were approved. Of these, **5** projects are for electric power generation with total capacity of **462 MW**, **5** other projects are for electricity transmission and/or substations and **2** are Oil and/or gas energy project. Together they represent a total investment of **1,561** MMUSD.

Presentation Date	Project Type	Region	Project Owner	Investment [MMUSD]	Web
28-oct-2015	High-voltage electricity transmission line	II	ACCIONA ENERGÍA CHILE SpA	2,6	Link
28-oct-2015	High-voltage electricity transmission line	VII	LUZPARRAL S.A.	8,4	Link
02-nov-2015	High-voltage electricity transmission line	Interregional	Energía de la Patagonia y Aysén	11,0	Link
05-nov-2015	Subestation	VI	TRANSNET S.A.	1,7	Link
18-nov-2015	Oil and/or gas energy projects	XII	Empresa Nacional del Petróleo - Magallanes	1,1	Link
18-nov-2015	Oil and/or gas energy projects	XII	PETROMAGALLANES OPERACIONES LTDA.	2,0	Link
18-nov-2015	Generation	XIV	Bioenergía de los Ríos S.A.	38,0	Link
20-nov-2015	Generation	VIII	Hidro Munilque SpA	3,6	Link
30-nov-2015	Generation	VI	Torsa Chile S.A.	66,0	Link
04-dic-2015	Generation	RM	Cementos Polpaico S.A.	42,0	Link
10-dic-2015	Generation	I	Espejo de Tarapacá SpA	385,0	Link
10-dic-2015	High-voltage electricity transmission line	Interregional	Interchile S.A	1.000,0	Link

Source: SEIA

In line with the above table, the evolution is presented for the last mobile year of investment associated to energy projects have received a favorable RCA. The total investment to date totaled **14,948 MMUSD**. In particular, energy power generation projects have a total investment of **13,146 MMUSD** (87.9%), equivalent to **3,512 MW** approved.

Investment evolution—Approved projects with RCA in the last 12 months



Source: SEIA

SECTORIAL REGULATIONS

1 Proposed Legislations in Process

Bulletin Number	Subject of the Proposed Legislation	Initiative and Urgency	Current Status	Bill Submittal Date	WEB
9890-08	Amends Decree-Law No. 323 of 1931 of the Ministry of Interior and other laws.	Simple Urgency	Second Constitutional Procedure (Senate). Now at the Mining and Energy Commission of the Senate, and that of the Treasury.	29/01/2015	Link
10161-08	Modifies the General Electricity Services Law to introduce mechanisms for fairness in electricity rates.	Great Urgency	The first constitutional procedure (the Senate). October 20, 2015. General approval by the Senate November 25, 2015: new time limit for presenting observations determined as December 7, 2015.	01/07/2015	Link
10240-08	Establishes new power transmission systems and sets up an independent oversight organism for the national electricity system.	Great Urgency	First constitutional procedure (Chamber of Deputies). October 22, 2015. General discussion in the Chamber's Mining and Energy Commission.	07.08.2015	Link

2 Sectorial Regulations Published in the Official Bulletin

Decree No. N°16T, August 7, 2015 that fixes the Average Node Price for the Central Interconnected System (SIC) and "Norte Grande" Interconnected System (SING), all of these in the context of the setting of pressure identified in Article 158 of the General Electricity Services Law, the Ministry of Energy. Link

3 Sectorial Regulations Not Published in the Official Bulletin

Exempt Resolution No. 570, dated November 2, 2015, modifies Resolution N° 540, 205, Approving Final Technical Report for setting short-term node prices for the Interconnected System of Norte Grande and the Central Interconnected System of October 2015. Link

Exempt Resolution No. 594, dated November 9, 2015: updates and reports generation and transmission works under construction. Link (Last version: Res. No 632 / Dec, 2th)

Exempt Resolution No. 615, dated November 23, 2015, Approves Expansion Plan for the Trunk Transmission System. Period 2015-2016. Link

Exempt Resolution No. 616, dated 24 November 2015, Adopts the final technical report for determining the annual value and the expansion Trunk Transmission Systems for the quadrennium 2016-2019, and supersedes CNE Exempt Resolution No. 597 of 2015. Link

Exempt Resolution No. 624, dated November 26, 2015, rectifies the trunk transmission system expansion plan. Period 2015-2016, approved by CNE Exempt Resolution No. 615 of 2015. Link

4 Expert Panel Rulings

There are no comments this period.

National Energy Commission

Miraflores 222, 10th floor
Phone. +56 (2) 2797 2600
Fax. +56 (2) 2797 2627

www.cne.cl

Santiago - Chile