Coal phase-out Chile

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Activities of GIZ with regards to coal phase-out in Chile

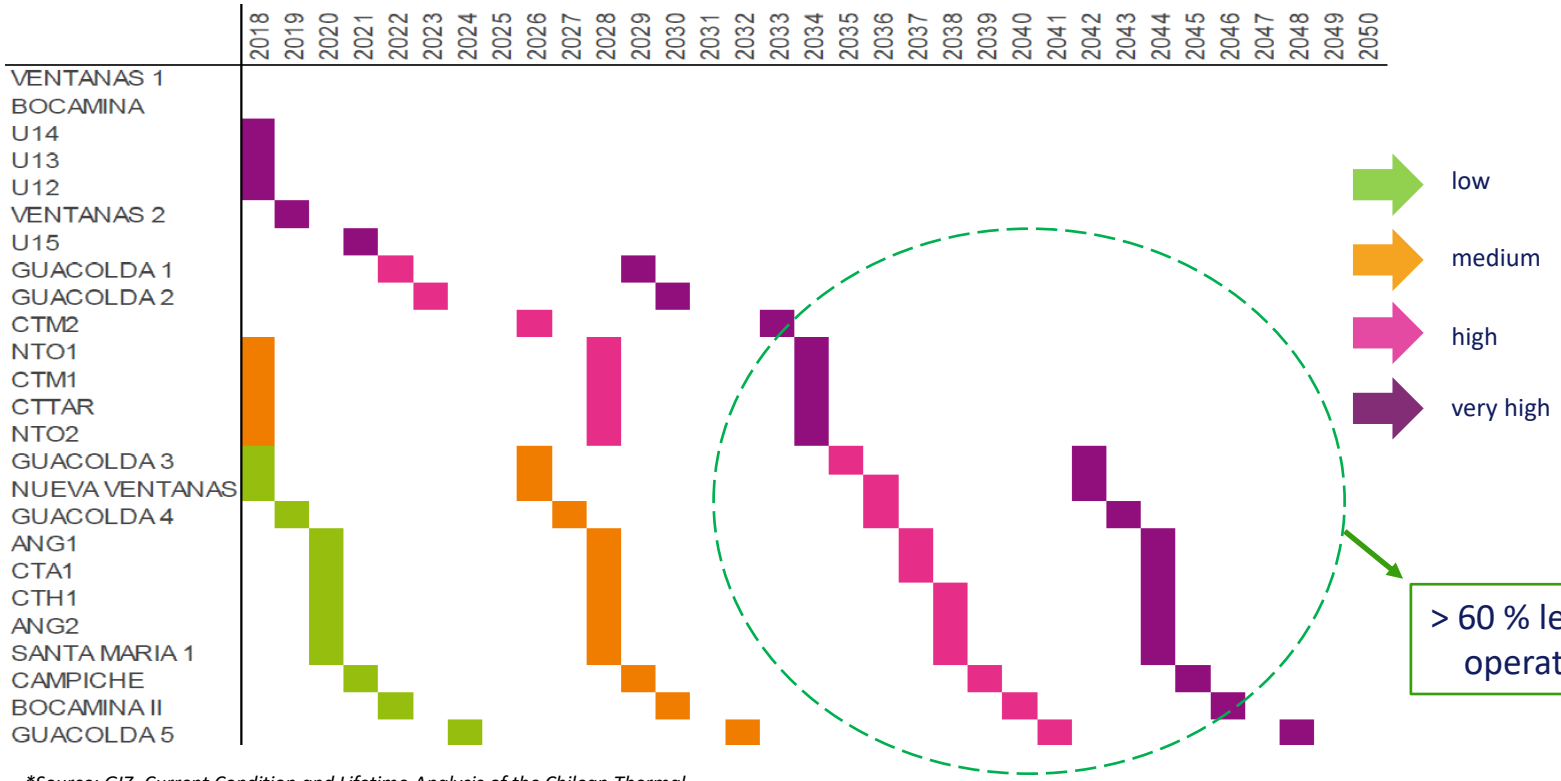
- Promotion of renewable energies (large scale, small scale; integration of variable RE, etc.).
- Investigation of flexibility of thermal power plants operating in Chile.
- Investigation on lifetime circle of coal fired power plants operating in Chile (Laborlec).
- Participation in the coal commission (29.01.2018 – 04.06.2019).
- Analysis of alternatives for converting coal fired power plants in Chile (Inodú).
- Feasibility studies and conceptual studies on repurposing coal fired power plants through molten salt storage (DLR)
- Analysis of alternatives for financing projects on reconversion of coal fired power plants (Chile: ODA restrictions)
- Studies on “just transition” and developing of guides for shut down coal fired power plants on specific sites in Chile.

Coal fired power plants in Chile

- **23 coal-fired power plants in operation in 2021**
- **Installed capacity: 4.948 MW**
- **35% of electricity generation in 2020**
- **North: PPAs with mining industry (24/7)**
- **100% imported coal**
- **>22 Mio. tCO2eq emissions caused by coal-fired power plants in 2020**
- **Jobs per power plant:**
  ~ 100 – 150 direct
  ~ 200 – 300 indirect

Company	Country of origin	Installed coal capacity in Chile [MW]	Installed coal capacity worldwide [MW]
AES-Gener	USA	**2.896**	9.800
ENGIE	France	**1.332**	6.600
ENEL	Italy	**350**	16.000
Colbun	Chile	**370**	-

Probability* of major maintenance work



Source: GIZ- Current Condition and Lifetime Analysis of the Chilean Thermal Power Plant Fleet; November 2017

Commission on coal exit (01/2018 – 06/2019)

Coal commission:

25 members: Ministries, energy industry, NGOs, mining sector, trade unions, city mayors, WWF, **GIZ**, associations, etc.

Resolution: Voluntary coal phase-out and establishment of a coal commission

Agreement between Ministry of Energy, **AES, ENEL, ENGIE** and **Colbun** on voluntary coal exit

29.01.2018

1st meeting

Discussion of the **goals**, expectations, and **process** of the commission meetings

11.06.2018

2nd meeting

Discussion and **analyses** of **basic documents** submitted to the commission

26.06.2018

3rd meeting

Discussion of **environmental** and **health impacts**

24.07.2018

4th meeting

Discussion about **international experiences**

20.08.2018

5th meeting

Discussion on the **impacts on the power grid**

(**security of supply** and impacts on **electricity prices**).

25.09.2018

6th meeting

Discussion on **environmental impacts**

(specific **air pollution** at sites)

23.10.2018

7th meeting

Discussion of **alternatives** for conversion and **further use** of power plant infrastructure

20.11.2018

8th meeting

Discussion on **social and economic aspects**

04.12.2018

9th meeting

Summary of the results and discussion of the **final documents**

03.01.2019

Official announcement of the first phase **of the coal phase-out**

Signing of agreements with AES, ENEL, ENGIE and Colbun for the **decommissioning of by 2024.**

04.06.2019

Voluntary coal phase out until 2040!

First phase of coal exit

energía ZERO carbón
un compromiso responsable

CIERRE DE LAS CENTRALES A CARBÓN
Cronograma Primera Fase
2019-2024

Primera fase: 1.731 MW

Tocopilla
Central: Tocopilla U12
Empresa: Engie
Potencia: 85 MW
P. Servicio: 1983

Central: Tocopilla U13
Empresa: Engie
Potencia: 86 MW
P. Servicio: 1985

Retirada: Junio 2019

Tocopilla
Central: Tocopilla U14
Empresa: Engie
Potencia: 136 MW
P. Servicio: 1987

Central: Tocopilla U15
Empresa: Engie
Potencia: 132 MW
P. Servicio: 1990

Retiro: Enero 2022

Mejillones
Central: CTM1
Empresa: Engie
Potencia: 162 MW
P. Servicio: 1996

Central: CTM2
Empresa: Engie
Potencia: 172 MW
P. Servicio: 1998

Retiro: Diciembre 2024

Iquique
Central: Tarapacá
Empresa: Enel
Potencia: 158 MW
P. Servicio: 1999

Retirada: Diciembre 2019

Puchuncaví
Central: Ventanas U1
Empresa: AES Gener
Potencia: 114 MW
P. Servicio: 1964

Retiro: Diciembre 2020

Coronel
Central: Bocamina U1
Empresa: Enel
Potencia: 130 MW
P. Servicio: 1970

Retiro: Diciembre 2020

Coronel
Central: Bocamina U2
Empresa: Enel
Potencia: 348 MW
P. Servicio: 2012

Retiro: Mayo 2022

Puchuncaví
Central: Ventanas U2
Empresa: AES Gener
Potencia: 200 MW
P. Servicio: 1977

Retiro: Diciembre 2022

2019 | 2020 | 2021 | 2022 | 2023 | 2024

Fuente: Ministerio de Energía

Actualizado a Mayo 2020

4e giz

Why considering repurposing coal plants in Chile?

- Relatively new installations (>60% less than 10 years in operation).
- Utilizing existing infrastructure:
  - Power generation assets
  - Transmission lines
  - Substations
  - Port facilities
  - Water collection (water rights)
- Maintaining jobs at power plant sites.
- Power plants are installed in strategically important locations of the existing power system.
- Decommissioning is lengthy, costly and has a lot of legal uncertainties, etc.

Options considered for repurposing in Chile

- Conversion to **gas-fired** plants (examples: GB and USA).
- Conversion to **biomass** plants (partial or full conversion; various examples in GB and USA).
- Conversion to **waste incineration** plants (example: 200 MW, Uskmouth/GB).
- Conversion to **gas-fired** plants with full or partial operation on **green H2.**

- Use of the land for **industrial development** (decommissioning).
- Use of the **port infrastructure** (export of copper, green H2 derivates,...).

- Conversion to **seawater desalination** plants and water supply for cities, agriculture and mining.

- Conversion to **industrial green H2 production** (injection to existing gas grid; export of H2 derivates,..)

- **Thermal energy storage:**
  - Pilot: Hot-Air-Storage („hot rock“; 1,5 MW Siemens/Gamesa)
  - Pilot: Molten-Salt-Storage (pilot project „Store to Power“, RWE and DLR)

Molten salt thermal storage „Carnot Battery“
(Pilot initiative: Ministry of Energy, national TSO, AES-Gener and Engie)

More about the Chilean energy transition:

https://www.4echile.cl/recursos/maqueta-digital/

https://www.youtube.com/watch?v=zoxvPolaVv4&t