



PPP: An Innovative Solution for Developing Energy Supply in Chile

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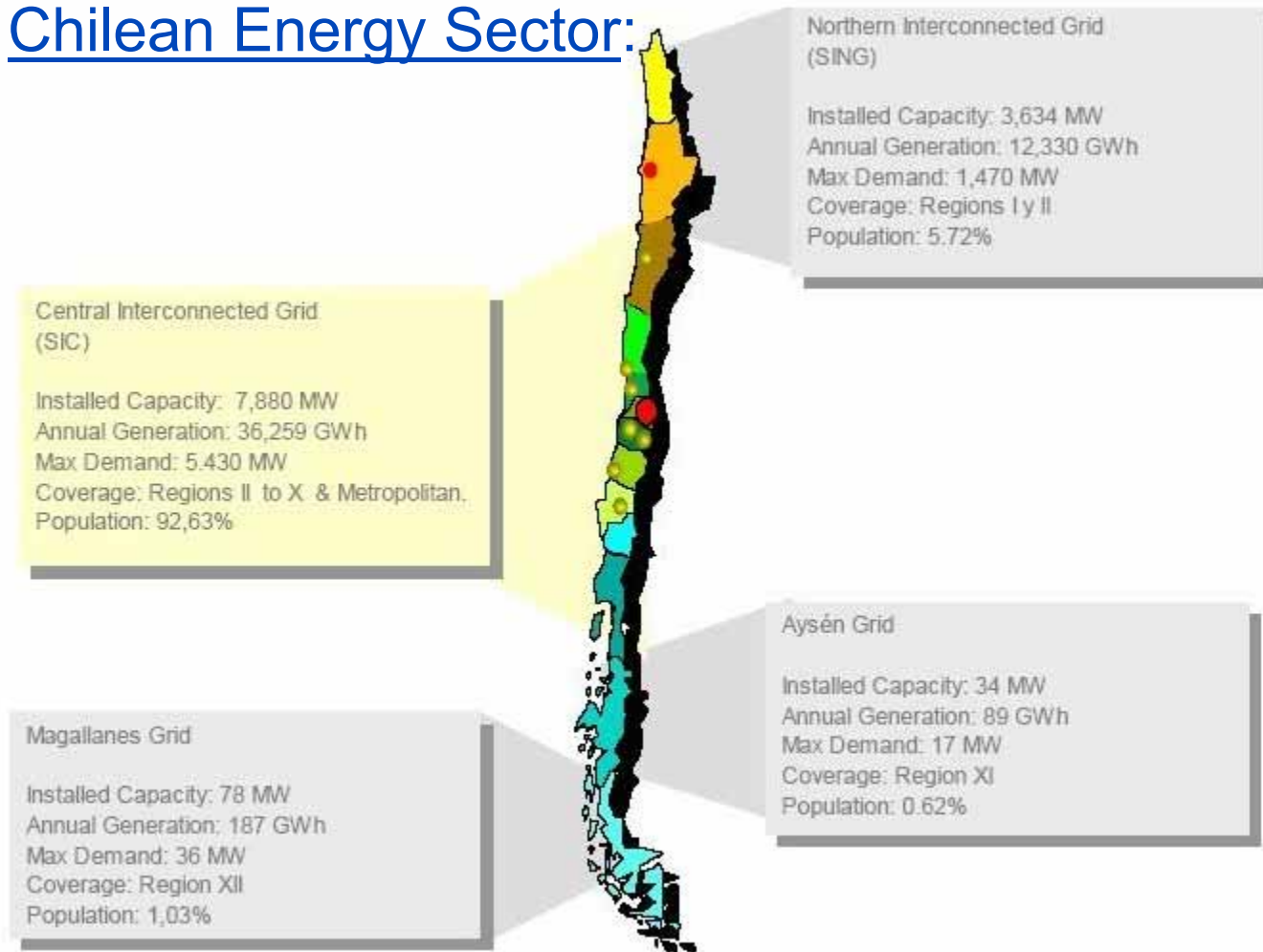
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4. New PPP projects
5. Conclusion

1. Introduction

- Chilean Energy Sector:



Note: Installed capacity: figures as at 31 December 2004. Gross generation: SIC and SING figures for 2004, while Aysén and Magallanes systems figures for 2003

1. Introduction (2)

SING:

- generation: nat. gas + coal – 3600MW
- mainly free clients – 1500MW

SIC:

- generation: hydro + nat. gas – 7800MW
- mainly regulated clients – 5400MW

SING

SIC

-
- Office
 - Power station in operation
 - Power station under construction
 - Gas pipe in operation
 - Water station in operation

1. Introduction (3)

- Characteristics (in non-crisis conditions pre-2004):
 - Two main non-interconnected electricity systems: SIC - SING
 - Capacity situation:
 - a. SING overcapacity;
 - b. SIC equilibrium in normal hydrology; lack of capacity in dry years
 - High dependence on:
 - a. hydro (SIC)
 - b. Argentine natural gas (SIC and SING)

1. Introduction (4)



1. Introduction (5)

- As from 2004: Crisis of Argentine gas: export limitations to Chile
 - SING restrictions up to 20%
 - > overcapacity disappeared
 - SIC severe restrictions up to 100%
 - > overexposure to hydro risk, serious problems in case of (double) drought (no gas and no water)

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2. General Comments on PPP in Chile

- Two Concepts of PPP:
 - *Sensu Stricto*: private financing of public service (UK)
 - Authorities define a public service, its needs and its goals
 - Authorities grant LT concessions/permits to private sector
 - Private sector operates and finances, recovering through service
 - Client: either authority or private end-user
 - *Sensu Largo*: any package of solutions (contractual or not) containing contributions of both public and private sectors, in order to trigger development. Public sector may contribute by way of:
 - Specific Regulation (long-term stability: “contract” concept)
 - Organize triggering initiative
 - Direct Project Interventions

2. General Comments on PPP in Chile (2)

- Chilean Energy Sector: to some extent PPP *sensu stricto*
 - Some energy services are declared to be “*public service*”, if and when they address the general public -> need for a **concession**
 - Electricity: *distribution*
 - Gas: *distribution*
 - Reason: regulates a *de facto* monopoly: public pays for service, state requires quality, minimum coverage, reach, etc.
 - No other energy operators are “public service”
 - However: **rights of way** required for *generation, gas pipelines (transportation and distribution), electric transmission* (only truncal and sub-truncal): no monopoly, not addressing the general public

2. General Comments on PPP in Chile ⁽³⁾

- Chilean Energy Sector: seriously PPP *sensu largo*
 - Triggering factor for PPP: *blocking* situation (*market failure*) or *urgency*
 - Private Sector does not (timely) invest: insufficient profitability – risk too high (no financing in the market) – big size of investment
 - No replacing State initiative: philosophy of non-interventionism – financial restrictions (budget)
 - Solution: authorities trigger private sector initiative via quasi-contractual structures (sometimes contractual)
 - LT Regulation: price regulation (node price); operational conditions (environmental restrictions, supply obligations)
 - Organizing triggering initiative: tenders, RFP
 - Subsidy or (Co-)Financing
 - Direct Equity Stake

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3. History of PPP successes

- Case 1 - Ley Corta I & II (2004-2005)
 - Market Failure 1: transmission cost entirely paid by generators without possible pass-through to regulated clients (node price)
 - some distcos located far away from generation center could not get offers for PPAs (even after several RFPs), lost the 3-yrs advance contractual coverage of their demand
 - transmission operators did not invest in lines to remote areas as nobody would pay for energy transport over these lines (no PPAs)
 - nobody interested in constructing a transmission line SIC-SING in order to bring (pre-crisis) SING overcapacity to SIC
 - **PPP intervention (1) - 2001**: Resolución 88 – 2001 obliges all generators to supply all required energy to “*distcos without contract*” (i.e. after a number of unsuccessful tenders) in function of each generator’s market share, mainly at regulated price (node price)

3. History of PPP successes (2)

- Case 1 - Ley Corta I & II (2004-2005) (ctd)
 - **PPP intervention (2) - 2004:** Ley Corta I - 2004 defines three categories of lines (truncal – subtruncal – additional), and transmission cost repartition among generator and client according to injection/withdrawal (truncal 80%-20%; subtruncal 100%)
 - **PPP intervention (3) – 2005:** Ley Corta II – 2005 allows generators to charge to Resolución 88 clients more than node price, up to the system's marginal cost (Cmg)
- > **Result:** effective: "distcos without contract" got energy supply; generator's transmission cost decreased; phenomenon "distcos without contract" progressively disappearing through increasing node prices; *however:* (i) no SIC-SING interconnection (*Argentine gas crisis took away SING overcapacity*); (ii) timing aspect between 2001 and 2004-2005 measures

3. History of PPP successes (3)

- Case 1 - Ley Corta I & II (2004-2005) (ctd)
 - Market Failure 2: Argentine gas crisis
 - increased risk of non-operation of single-fuel thermal power plants
 - increased generation cost (diesel) without possibility for pass-through to regulated customers (node price)
 - **PPP Intervention - 2005:** Ley Corta II
 - Art. 99bis El. Law (1990) providing that generators cannot invoke drought as *force majeure*, shall also apply to “*drought of gas*”
 - Further liberalisation of market by decrease of threshold for regulated-client regime (from 2.0MW to 0.5MW)
 - Regulated contract may fix price LT
 - Progressive Node price increase through narrower bandwidth between average market price and regulated price (from 20% to 5%)
- > **Result:** effective: supply ensured (no *force majeure*), higher generation cost gradually passed-through to regulated market, timing aspect taken care of

3. History of PPP successes (4)

- Case 2 - World Bank's *Kyoto Protocol* in Chile
 - **Market failure:** Investment in emission-friendly generation capacity is non-profitable ("*least expansion cost*")
 - SING: development through gas (before 2004) and coal (present)
 - SIC: hydro is emission-clean -> however: very expensive investment; required big size of projects creates other environmental disturbances (dams, lakes, low water levels); thermal development is based on gas (before 2004) and coal (present)
 - **PPP solution:** World Bank **Certified Emission Rights** (CERs)
 - Investment in capacity which complies with "*additionality*"
 - either *de facto* reduces emissions as from COD (*displacement* of coal or diesel fired units in actual dispatch)
 - or replaces a more polluting unit which is expected to be developed under the system's development plan
 - Investment would not be profitable without CERs (*triggering factor*)

3. History of PPP successes (5)

- Case 2 - World Bank's *Kyoto Protocol* in Chile

Generation projects in Chile which effectively received CERs and may trade them in the international CER markets (all projects in SIC):

- **Chacabuquito** hydro-power plant (26MW)
 - First project in Latin America to obtain CERs (2002)
 - Volume obtained: 2,800,000.- tonnes
 - First ERPA in Latin America – with IBRD
- **Quilleco** hydro-power plant (70MW)
 - Procedure 2004-2005
 - Volume obtained: 5,500,000.-tonnes
 - ERPA with IBRD
- **Hornitos** hydro-power plant (55MW)
 - Procedure started in 2005
 - Expected volume: 3,700,000.-tonnes

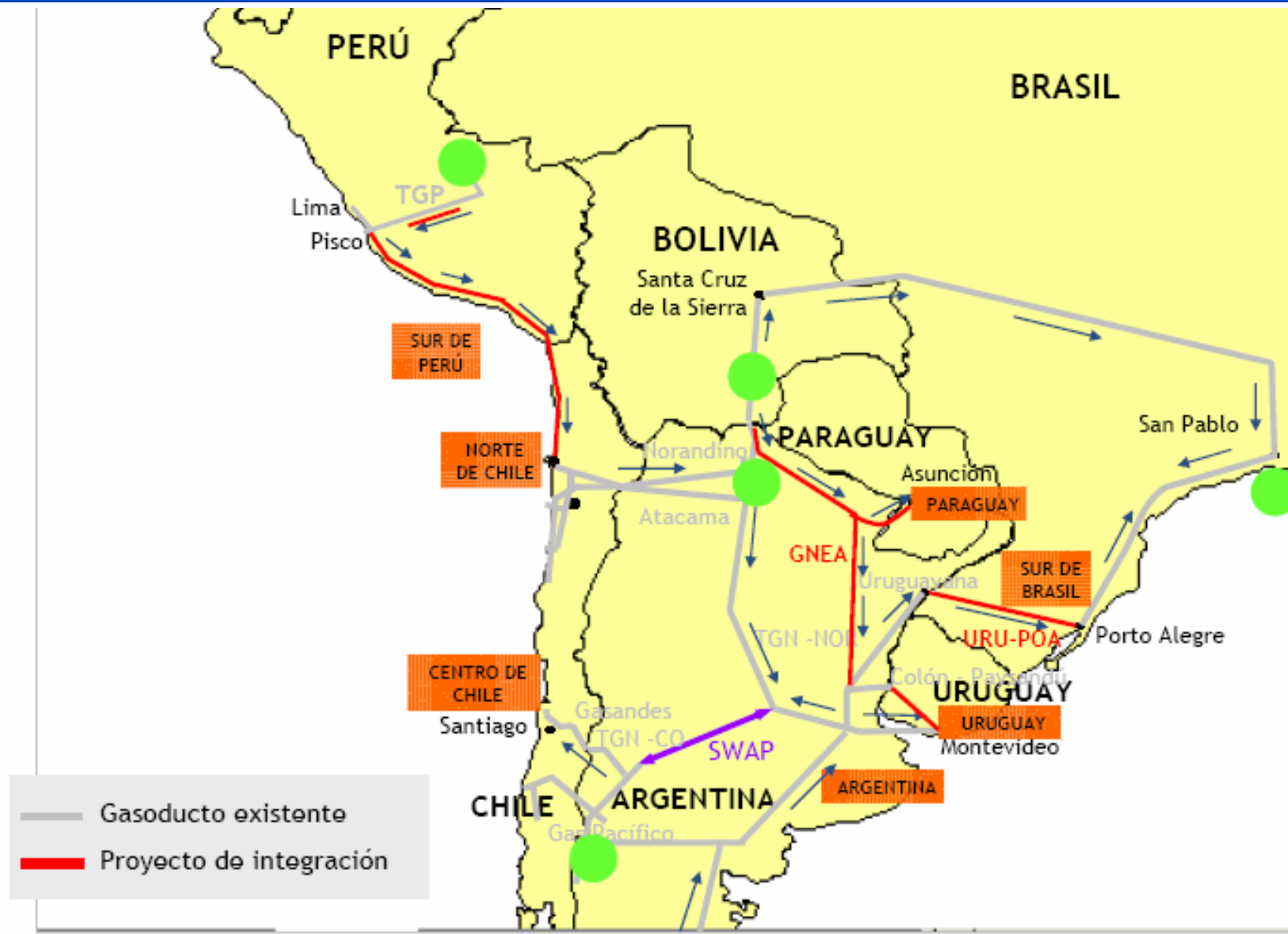
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4. New PPP Project Initiatives

- Case 1 - Energy Ring (*Anillo Energético*)
 - **Market failure:** Argentine gas crisis
 - Degradation of gas production capacity in Argentina, increasing internal consumption in Argentina, decreasing exports to Chile
 - No perspective of short-term remedy
 - SIC and SING historically huge investments in thermal capacity burning Argentine gas as fuel
 - **Proposal:** Energy Ring: huge infrastructure project for interconnection through gas-pipeline of Peru-Chile-Argentina-Uruguay-Brazil (bringing Peruvian gas reserves to the other member-states)

4. New PPP Project Initiatives (2)



4. New PPP Project Initiatives ⁽³⁾

- Case 1 - Energy Ring (*Anillo Energético*) (ctd)
 - **PPP-Proposal:**
 - Private investors: invest, operate, maintenance, contracting, finance
 - Public sector:
 - Multilateral treaty among 5 countries, providing a.o.
 - Investment protection
 - Free movement of goods (gas)
 - Waiver of import duties
 - Co-operation for financing: IDB-IBRD-IFC
- Typically, multilateral treaty and public co-financing could unblock start of this project

4. New PPP Project Initiatives (4)

- Case 2 - The SIC Long-Term LNG-Project

- **Market failure 1:**

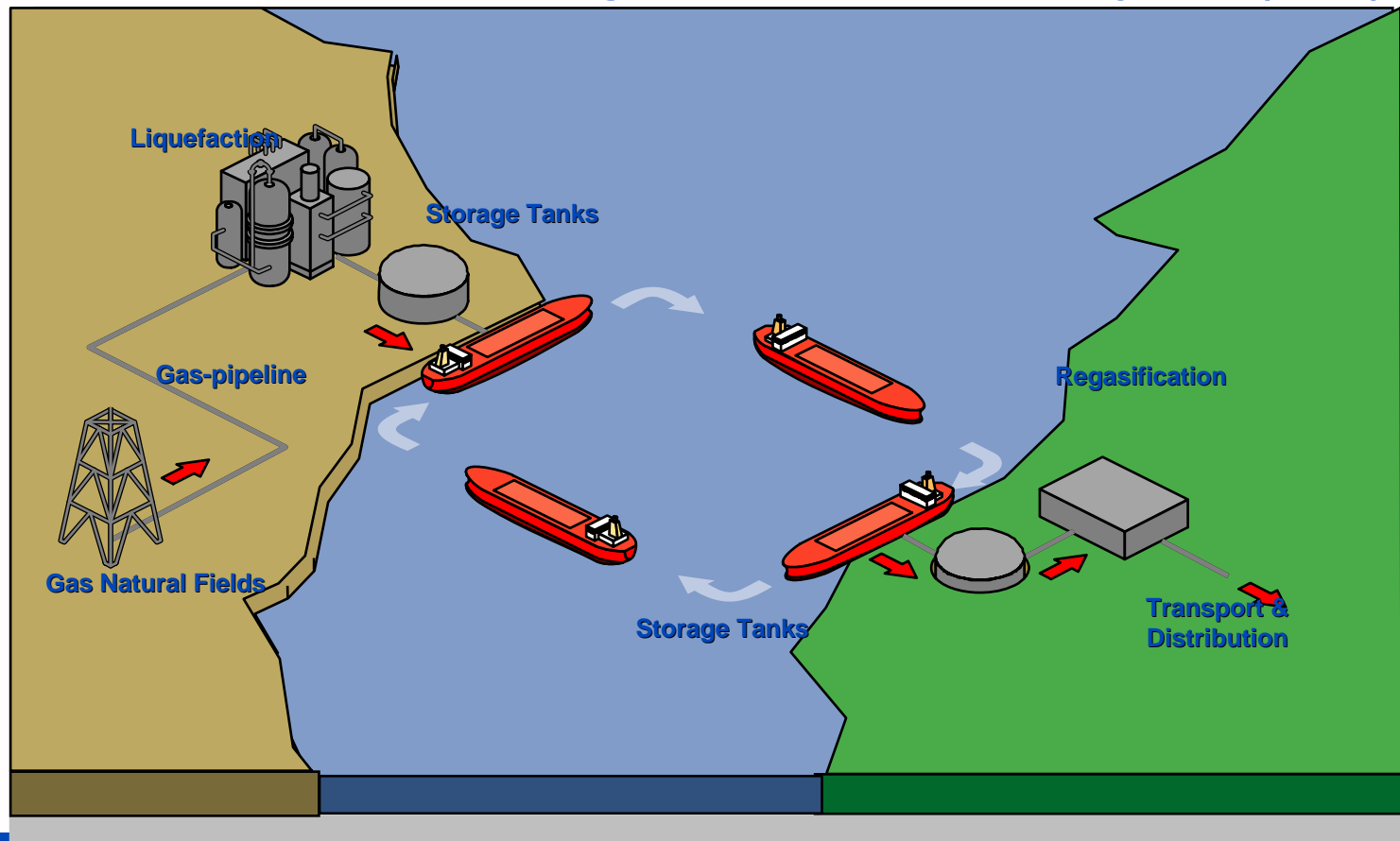
- (1) Argentine gas crisis, Argentine gas sellers' default under Gas Sales Agreements to Chilean customers — lowered availability of natural gas; no perspective for quick remedy
- (2) Huge dependence of Chile from Argentine gas: residential gas consumption in Santiago; fuel for thermal power plants

- **PPP intervention:** State company ENAP's LNG initiative

- ENAP idea of LNG as a long-term valid alternative – basic technical study (2004-2005)
- ENAP teaming-up with other off-takers, into a Pool
- Off-takers Pool organizes international public tender -> efficient PPP
-> *ENAP as public and as private partner*

4. New PPP Project Initiatives (5)

- Case 2 - The SIC Long-Term LNG-Project (ctd)



4. New PPP Project Initiatives (6)

- Case 2 - The SIC Long-Term LNG-Project (ctd)
 - **Market failure 2:**
 - (1) Offers in LNG International Tender revealed (i) much higher international LNG price than expected, and (ii) short-term unavailability of LNG on world markets at normal prices
 - (2) Need for LT off-take commitments given huge terminal investment, but possibility of (unreliable) Argentine gas coming back, at prices lower than LNG – Long-term LNG off-take at increased risk
 - **Room for new PPP intervention ?**
 - > objective: LNG is a critical asset (reliable fuel source) -> public intervention in order to render the risk of LT LNG off-take acceptable for private financing, assuring LT profitability and returns
 - > How: guaranteeing, to terminal owner, LT validity of Off-take Contract with Pool, even when cheaper Argentine gas comes back (risk of changing LNG to “insurance” function before maturity)

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5. Conclusion

- Chile & PPP: PPP has been a successful mechanism for development of the energy sector in Chile
- Chile has been applying PPP sensu largo: PPP fits very well within basic Chilean concepts
 - > basic philosophy of (i) non-intervention of public sector and (ii) market forces to steer infrastructure development
 - > public sector as a *facilitator* of economic development where required (market failure)
- Chilean Energy Sector: development entirely done by private sector – PPP comes in for reasons of (i) market failure, (ii) urgency or (iii) a combination of both

5. Conclusion (2)

- In case of market failure: regulator has a track record of first assuring private sector's contribution (goal setting: assuring energy supply), then adapting possible disequilibriums with additional measures (first with, later without time-gap)
- Chile's concept: long-term stable energy-regulation, as a counterpart for private contributions, presenting the effect of a real “package deal” between private and public sector
 - > entirely fits the PPP-concept