

*INPRO Dialogue Forum 4 “Drivers and Impediments
Regional Cooperation on the Way to Sustainable Nuclear
Energy Systems”*

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Carlos Espinoza – Peruvian Nuclear Energy Institute

Paul Prado – Ministry of Energy and Mines

Peru

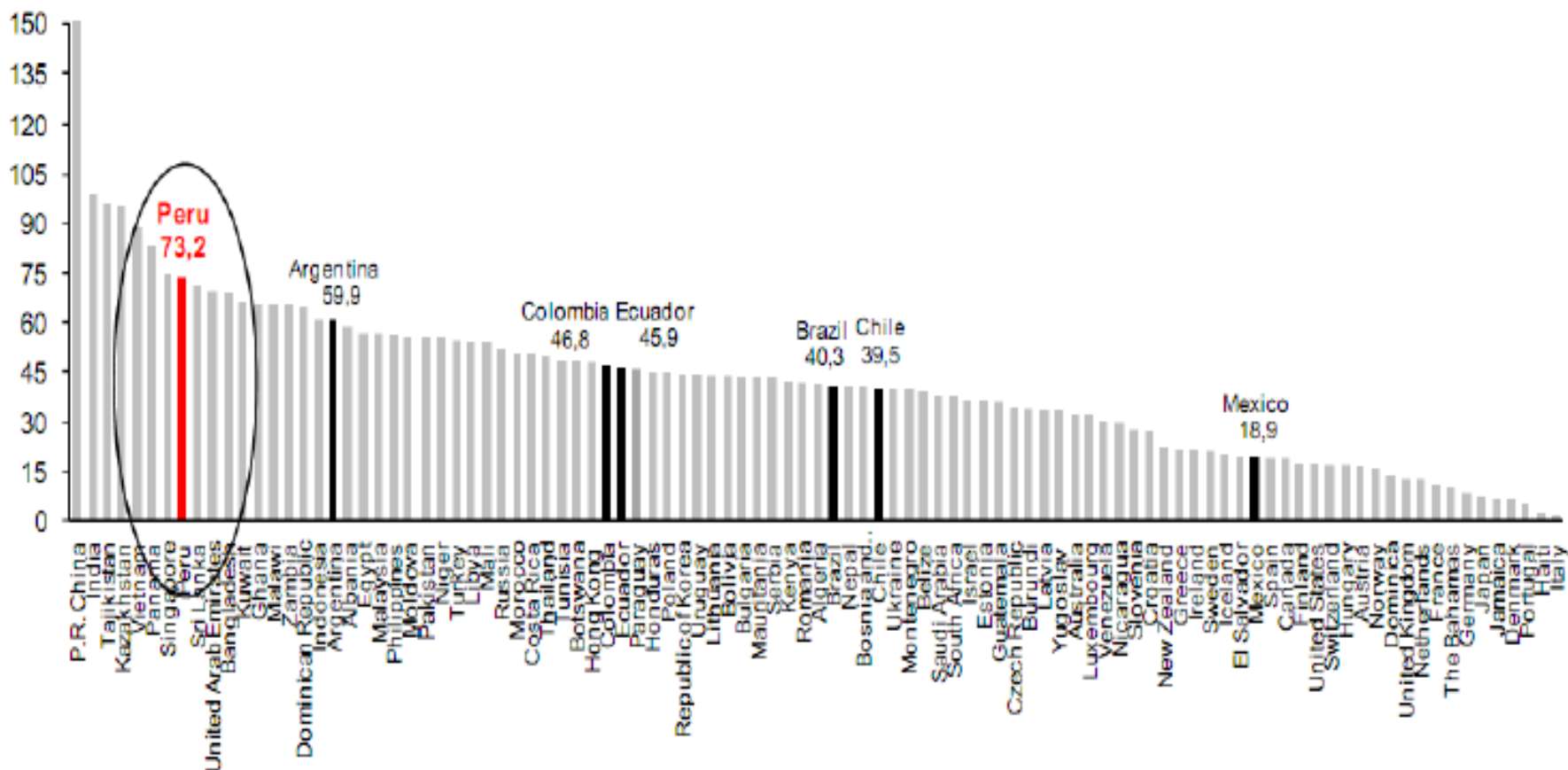
Republic of Peru - Key Facts



- **Capital:** Lima
- **Position:** West South America
- **Population:** 30 million
- **Area:** 1 285 000 km²
- **Coast Line** 2 400 km
- **GDP (US\$)** 305.8 billion (41th)
- **GDP – Real Growth Rate** 6,9% (2011)
- **Peru has strong macroeconomic performance but is depending on minerals and metals exports**

Peru among the fastest growing economies in the world

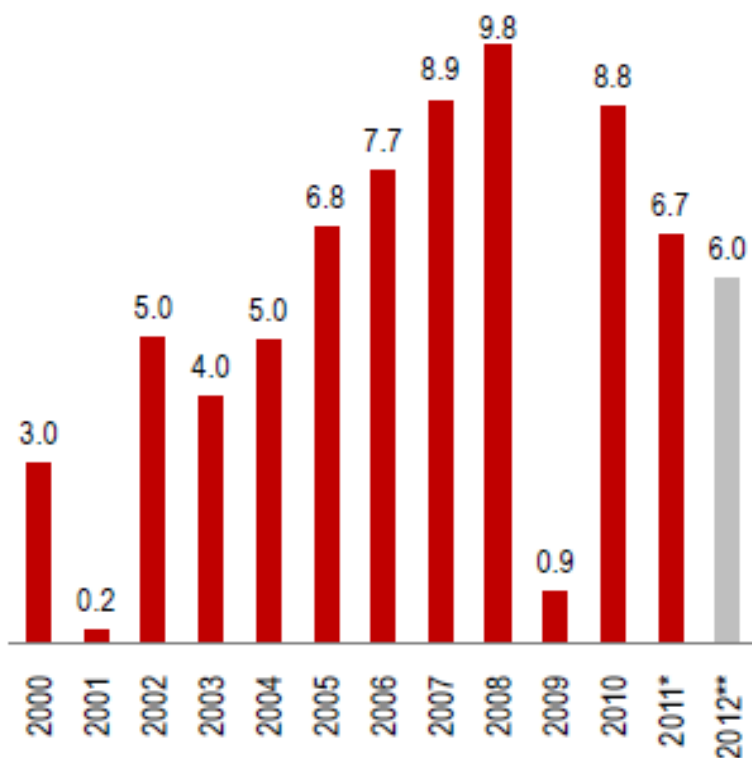
World's GDP 2002-2010
(Var. Accrued.%)



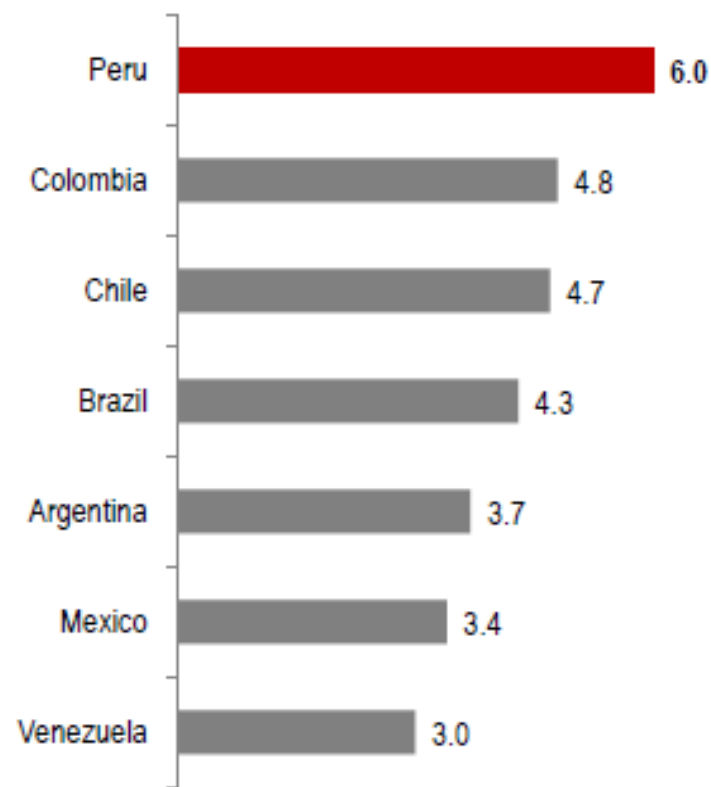
Source: IMF

Peru will continue leading regional growth

Peru Gross Domestic Product
(US\$ Million)



Forecast - LATAM: Real GDP 2012-2014
Average annual % variation)



Source: Central Reserve Bank of Peru, Ministry of Economy and Finance, IMF.

* Preliminary figures

** Estimated figures

Peru offers a favorable legal framework for foreign investment ...

- Non discriminatory treatment: Foreign investors receive the same treatment as local investors.
- Unrestrictive access to most economic sectors *.
- Free transfer of capital.
- Free competition.
- Guarantee for Private Property.
- Freedom to purchase stocks from locals.
- Freedom to access internal and external credit.
- Freedom to pay royalties.
- Network of investments agreements and member of ICSID and MIGA.
- Peru participates in the Investment Committee of the Organisation for Economic Co-operation and Development (OECD) – It promotes the implementation of the Guidelines for Multinational Enterprises.

*Investments that require authorization: Located within 50 km in the frontier line and those destined to arms, ammunitions and explosive. Likewise, a principal local partner for investments in radio and television as well as in air transport is required.



IAEA



Working to become a globalized economy, with preferential access to the world's largest markets



These countries stand for enlarged market of over 4 billion people with a joint GDP over US\$ 56 billion

↓

Also represent 96% of Peruvian exports to the world

Perú is a Mining Country.....

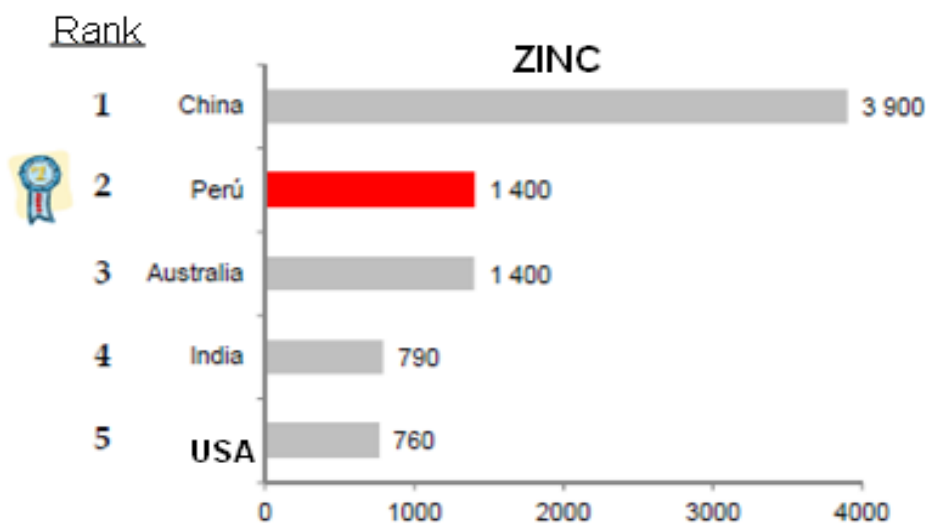
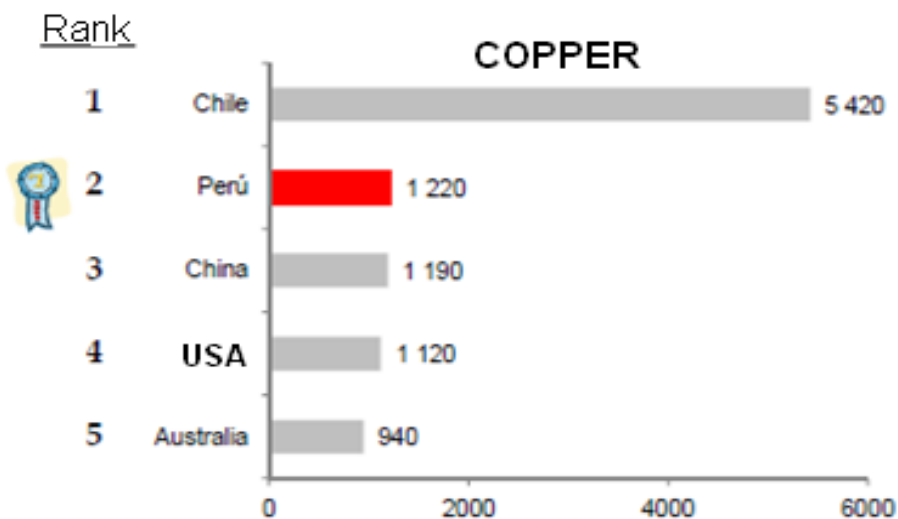
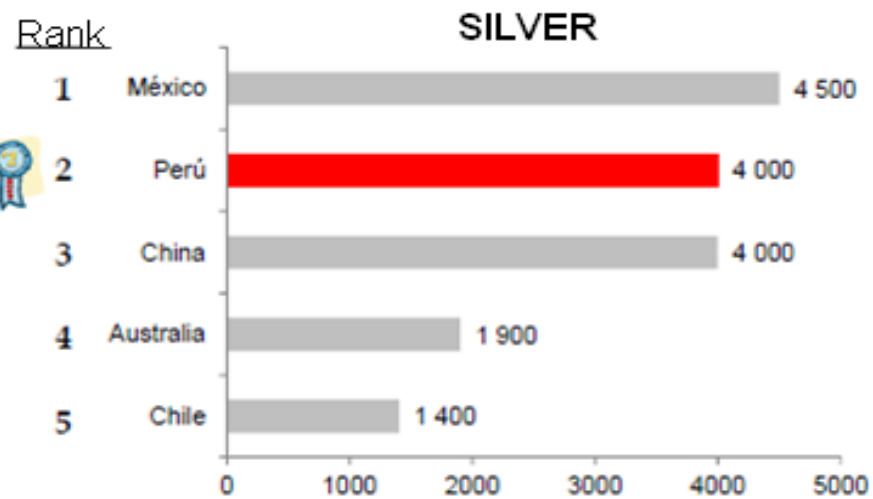
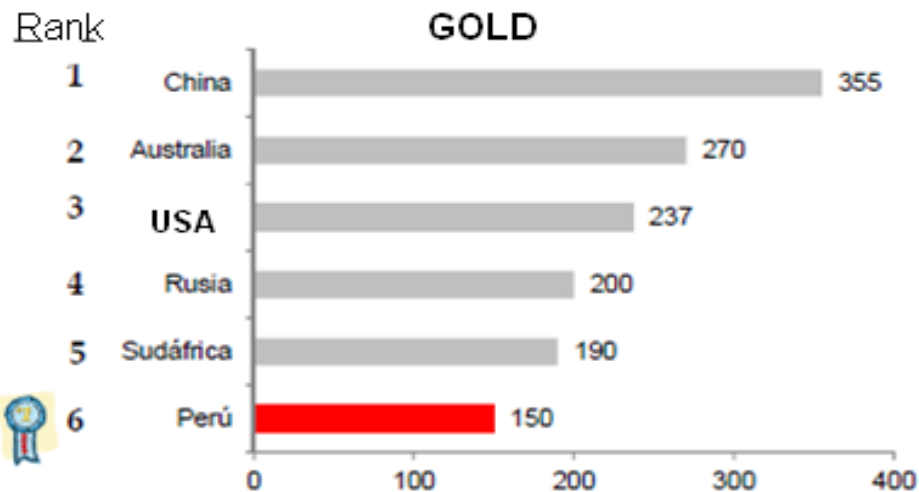


- ❖ **Polymetallic country**, second in copper, third in zinc and first in silver reserves worldwide.
- ❖ 11.52 % of the territory is subject to mining concessions, and only 1.28 % is used for mining exploration and exploitation.
- ❖ **Worldwide:** second silver and copper producer. **In Latin America:** 1st gold, zinc, tin and lead producer and 2nd copper, silver and molybdenum producer.
- ❖ **In 2011, mining exports grew by 23.25%** despite having registered a drop in the volume of production of most minerals.
- ❖ **Peru is one of the few countries with non-metallic mineral deposits, such as mercury, selenium and cadmium.**

Many large mining projects will require more and more energy



Peru is a major minerals producer in the world



Uranium Perspectives



Status	Type	Location	Ownership	Option	Reference Date
exploration		Peru	75%		Sep 2011
Past Producer	Town/District	Recovery			
	Puno				

Resources for U3O8 - U3O8

	Tonnage (MT)	Grade (%)	Content (Mlb)
M&I	40.41	0.02	17.49
Inf.	34.20	0.02	15.08
Meas.	9.43	0.03	5.20
Ind.	30.99	0.02	12.30

Mineral Values in Property

In millions of USD.



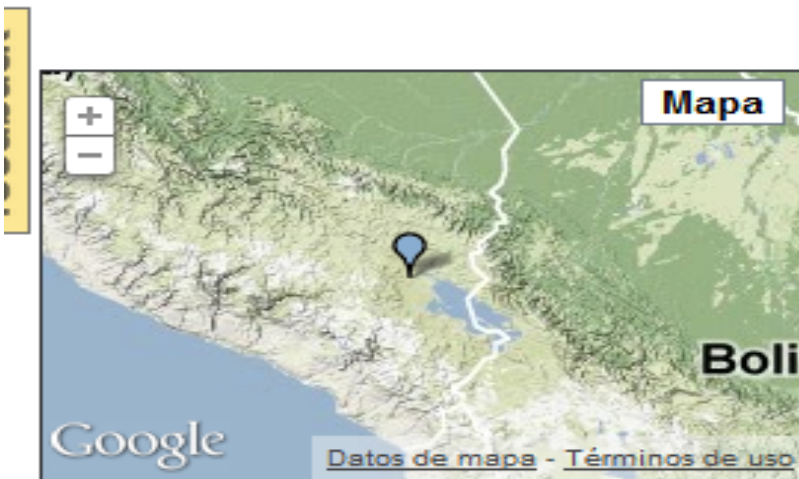
■ U3O8 - U3O8 100.0% \$89.06

Tonnage by Category

In millions of tonnes.



■ M&I 54.2% 40.41 MT
 ■ Inferred 45.8% 34.20 MT



Upto 30 000 Tons

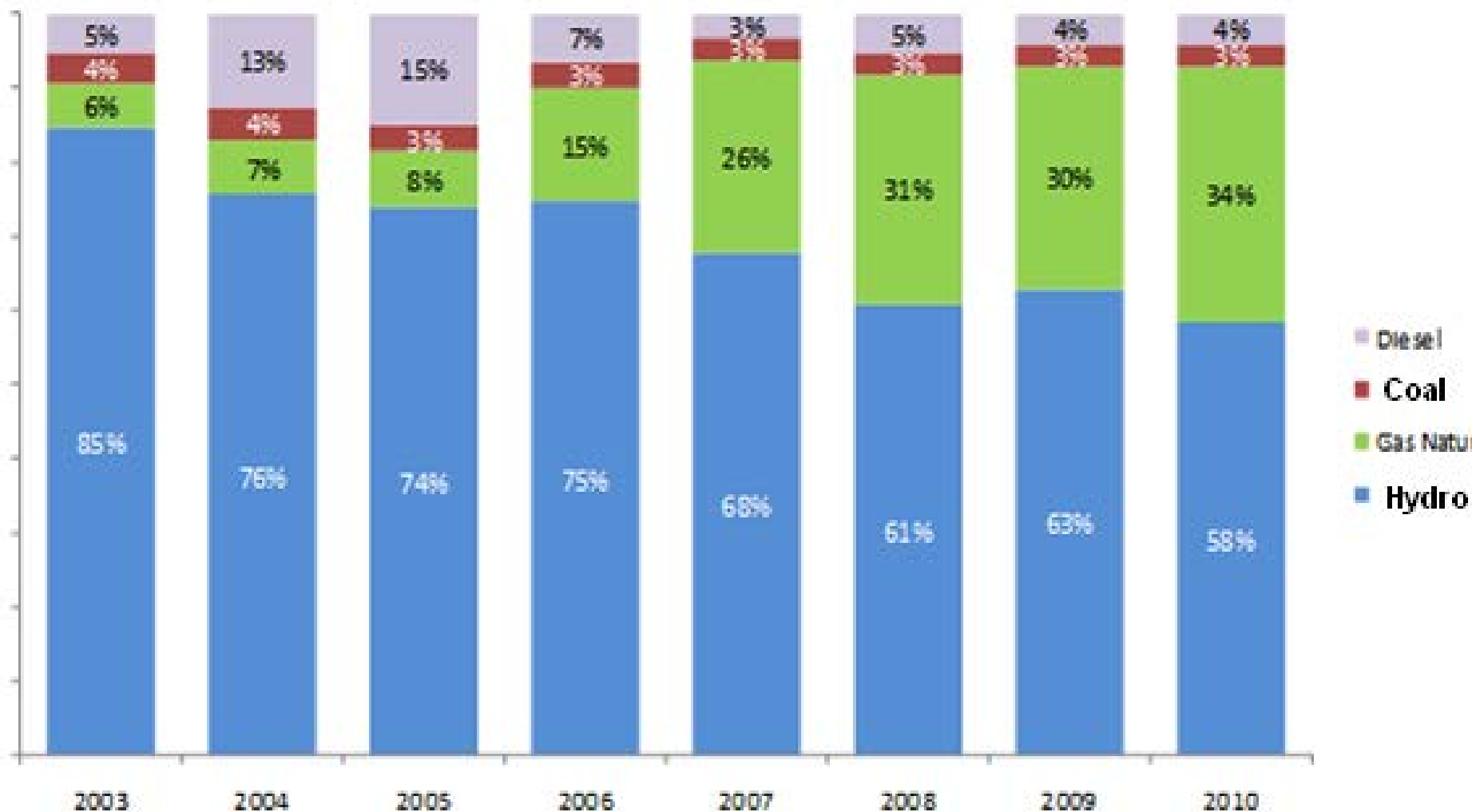
Peru's energy potencial

cabecera.jpg

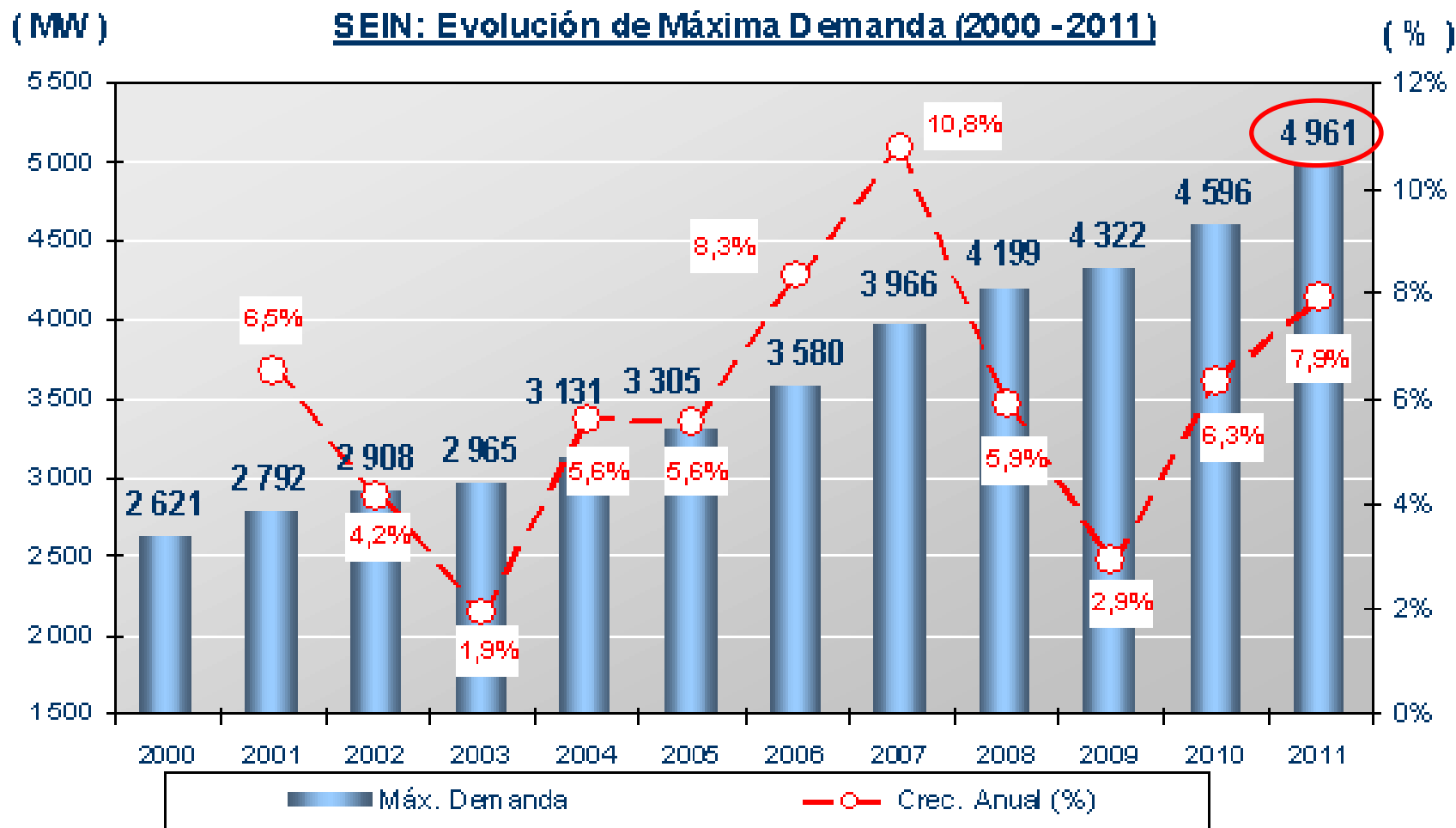


- ❖ **Great energy potential:** Wide availability of water and natural gas resources have made possible to deal with the increasing electric demand of the country (2011 growth rates: 8.3%)
- ❖ **Resources to be discovered and exploited:** There are other renewable energy sources to explore, such as solar, wind, biomass and geothermal energy sources.
- ❖ **Energy matrix mostly based on renewable sources** (about 57% of the electric demand is generated with hydro-electric sources, 38% with natural gas, 2% with coal and 3% with other sources)
- ❖ In the last five years, the energy production has increased in 40.38% due mainly to the thermoelectric generation growth with an annual average rate of 16%.
- ❖ Main economic groups that comprise 62% of energy production in Peru are Endesa, Globeleq, Suez and Duke Energy.

Peru has a diversified energy matrix



However..., demand is growing fast



Energy supply is not enough



Año	Central	Tipo	Región	Ubicación	Capacidad MW
2012	CT Kallpa CC	T	Lima	C	293
	CH RER centro	RER	SEIN	C	48
	CH RER Norte Medio	RER	SEIN	NM	18
	CH RER sur	RER	SEIN	S	60
	RER Otros	RER	SEIN	SEIN	80
2013	CH HUANZA	H	Lima	C	90.6
	CTGN Tablazo	T	Piura	N	30
	CT Fenix CC (diesel)	T	Lima	C	520
	CT Chilca I CC	T	Lima	C	303
	CT Ilo Reserva Fria	T	Moquegua	S	564
	CT Talara Reserva Fria	T	Piura	N	177
	CH RER centro	RER	SEIN	C	0
	CH RER Norte Medio	RER	SEIN	NM	20
	CH RER sur	RER	SEIN	S	0
RER Otros	RER	SEIN	SEIN	142	
2014	CH QUITARACSA I	H	Ancash	N	112
	CH Molloco	H	Arequipa	S	302
	CH CHEVES	H	Lima	C	168
	CT Termochilca (SD Olleros) CS	T	Lima	C	200
	CT Eten Reserva Fria	T	Lambayeque	N	214
	CH RER centro	RER	SEIN	C	82.2
	CH RER Norte Medio	RER	SEIN	NM	0
	CH RER sur	RER	SEIN	S	0
	RER Otros	RER	SEIN	SEIN	108
2015	CH Machupicchu	H	Cuzco	S	100
	CH Tarucani	H	Arequipa	S	49
	CH PUCARÁ	H	Cuzco	S	150
	CH Santa Teresa	H	Cuzco	S	90
	CH Marañon	H	Huánuco	C	96
	CH Cerro El Aguila	H	Huacavelica	C	525
	CT Termochilca (SD Olleros) TV	T	Lima	C	100
	CT Fenix CC (GN) (*)	T	Lima	C	520
	CT GN Quillabamba	T	Cuzco	S	200
	CT Pucallpa Reserva Fria	T	Ucayali	C	40
	CT Puerto Maldonado Reserva Fria	T	Madre de Dios	S	18
	CT Nueva Esperanza	T	Zorritos	N	135

Proyectos de Generación 2012 - 2021

2016	CH Chaglla	H	Huánuco	C	406
	CH Belo Horizonte	H	Huánuco	C	180
	CH La Virgen	H	Junin	C	64.7
2017	CT GN Sur	T	Cuzco	S	200
2018	CH San Gabán IV	H	Puno	S	130
2020	CT GN Chimbote TG1 - CS	T	Ancash	N	340
2021	CT GN Chimbote TG2 - CC	T	Ancash	N	170
Total Centrales Hidroeléctricas					2 463
Total Centrales Térmicas					3 504
Total Centrales Renovables					558
Total					6 526
(*) Solo cambio de combustible de diesel a gas natural					
CH: Central Hidráulica		N: Zona Norte			
CT: Central Térmica		C: Zona Centro			
RER: Centrales Renovables		S: Zona Sur			
SEIN: Sistema Eléctrico Interconectado Nacional					

As a result..

1. Peru requires to develop nuclear electricity.
2. Peru is open to international collaboration in the Nuclear area
3. We can consider also uranium mining and milling.

We have some nuclear technology elements.....

HUARANGAL NUCLEAR CENTER



- 10 MW research reactor
- Radio-isotopes and radiopharmaceuticals production and export
- Regulatory office (small)

Impediments

1. Financial uncertainty about the cost and investments of first nuclear power plant.
2. Lack of knowledge to begin and sustain such effort.
3. Public acceptance: we need methodology to assess stakeholders opinion: parliament, public opinion leaders, political parties and to act in consequence.
4. Lack of human resources in the nuclear field.

Some ideas to begin

- Maybe we need a Master Plan to introduce nuclear technology for power generation in the long term.
- However, we don't discard shortcuts, as turn-key proposals, for demonstration purposes.
- In both cases, we will need much more specialized human resources.

Thanks for your attention

