Peru: Establishing Reference Scenarios, and Scenarios for mid and long-term mitigation scenarios

Preparado para:

PLANCC
PLANIFICACIÓN ANTE EL CAMBIO CLIMÁTICO

Por:

APOYO CONSULTORIA
SABER DECIDIR.

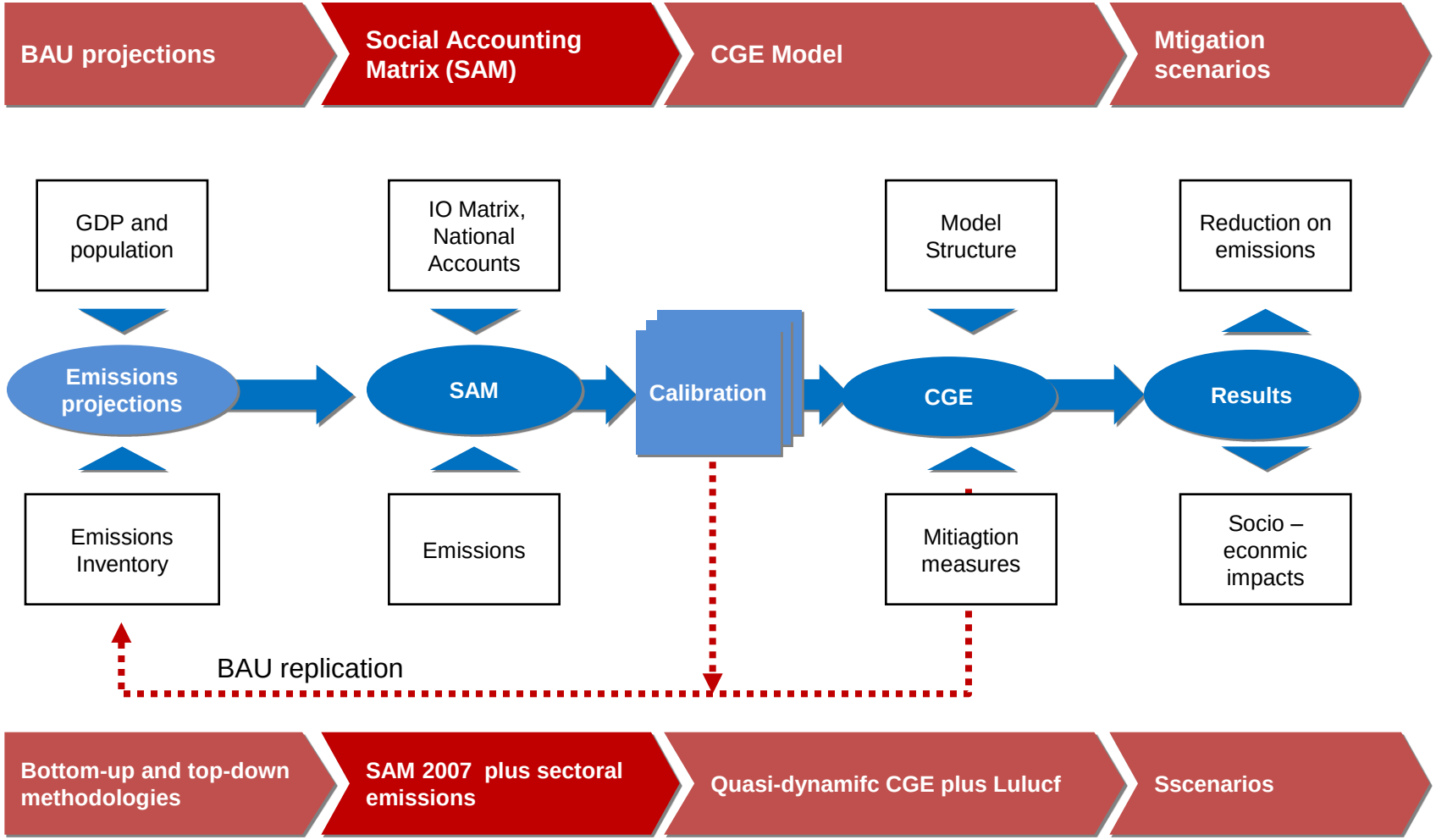
PMR: Approaches and Tools to Setting Mitigation Scenarios

Washington, September 2014

Summary of the work carried out for the model-building

The content of this presentation does not reflect Peru´s official position

Main steps for assessing the economy-wide effects of the proposed mitigation measures



APOYO CONSULTORIA

Key elements for building a reference scenario(1)

The content of this presentation does not reflect Peru´s official position

1) Definition and scope of the reference scenario
    1) Prospective approach versus just a passive reference “BAU”.
    2) Consider impacts of climate change on projections?
    3) Specification of international scenarios for mitigation emmissions and mitigation policies.

2) BAU scenario:
    1) GDP medium-long term projections
    2) Changes on the economic structure
    3) Representativeness of the Baseline (SAM 2007). Good year not likely to be repeated over time.
    4) Will tecnological innovations/market eventually take care of the problem?

Key elements for building a reference scenario(2)

The content of this presentation does not reflect Peru´s official position

3) Credible: Challenges
   1) Easier model /translations for stakeholders to get the insights.
   2) Results compared to the BAU don´t seem very worrying.
   3) Y2K scare.
   4) Perception of capture from NGOs or from funding sources with other agendas.

4) Credible: Positive Points
   1) Consultation process (cumbersome but may be simpler)
   2) Standarized model/approach
   3) Consistent Medium-Long term analysis:
      at least somebody is doing it.

Key Challenges to model GDP and emissions (1)

The content of this presentation does not reflect Peru´s official position

1. Projections of GDP using an accounting growth model.
    1. “Pessimistic” or historical- oriented analysts don´t buy results of convergence.
    2. Long-term cycles: boom and crisis.

GDP Growth Projections 2013-2050

The content of this presentation does not reflect Peru´s official position

1. **Demand approach: 2013 -2017:** **Takes into account the policy environment.**
   Considers expected impulses: X, I , G. Public investment.
   Consistent with financial programming.

2. **Accounting growth model: 2018 – 2050** **Production function is estimated : (Y/L)=A(K/L)^0.48**
   Capital stock is projected (K).
   Employment is projected (L). Demographic transition. Better human capital.
   Total factor productivity projected using past performance (A)

PERU: GDP PROJECTIONS

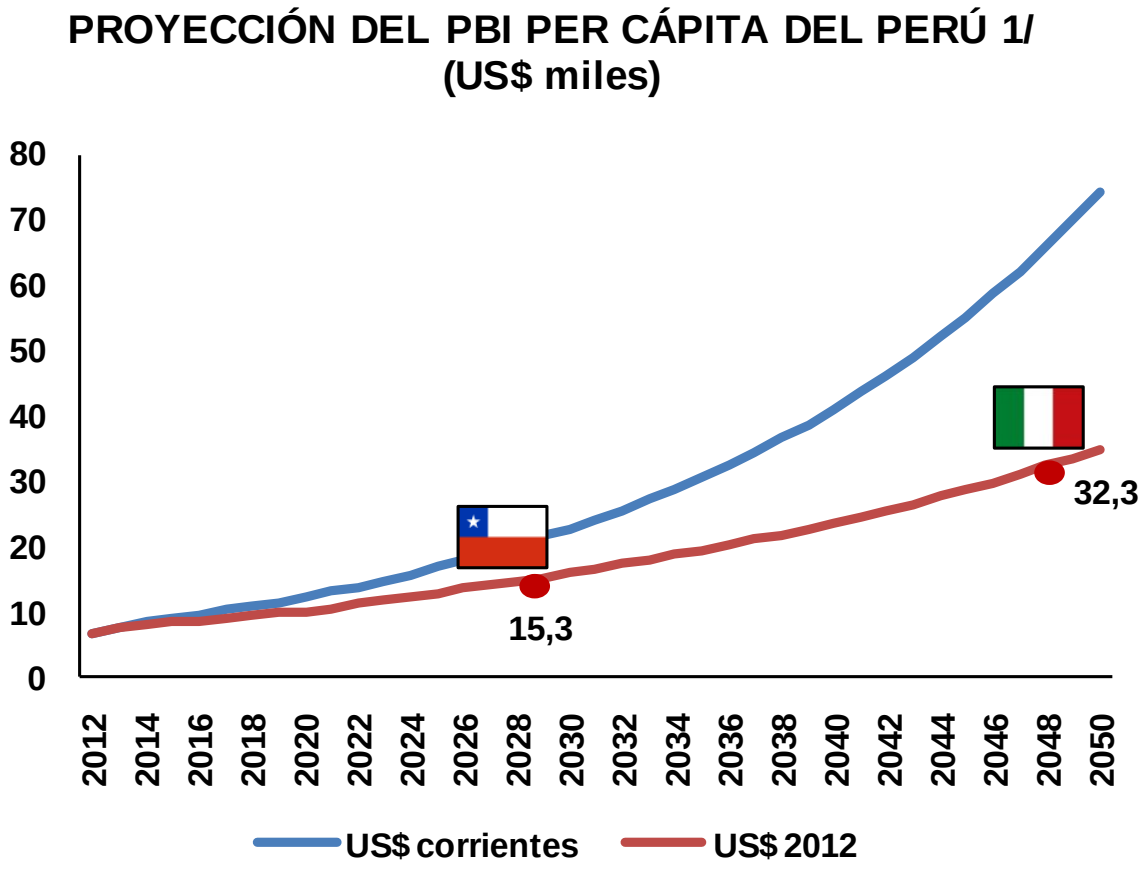
Period	Annual average GDP real growth (%)	GDP (Millones de soles de 1994)	GDP per cápita (2012 US$ 000)	GDP per cápita (nominal US$ 000)
2012	6,4	238 979	6,6	6,6
2013-2021	6,0	402 870	10,4	13,0
2022-2031	5,2	670 273	16,6	24,2
2032-2041	4,7	1 056 909	24,5	43,5
2042-2050	4,5	1 566 206	35,0	74,2

Fuente: APOYO Consultoría

Peru's GDP could grow 5.0% on average between 2013 and 2050.

Peru would reach Chile's current GDP per capita in 2029, and Italy's in 2048.

The content of this presentation does not reflect Peru´s official position



1/ Los niveles de PBI per cápita de Chile e Italia serían alcanzados en el 2029 y el 2048, respectivamente.

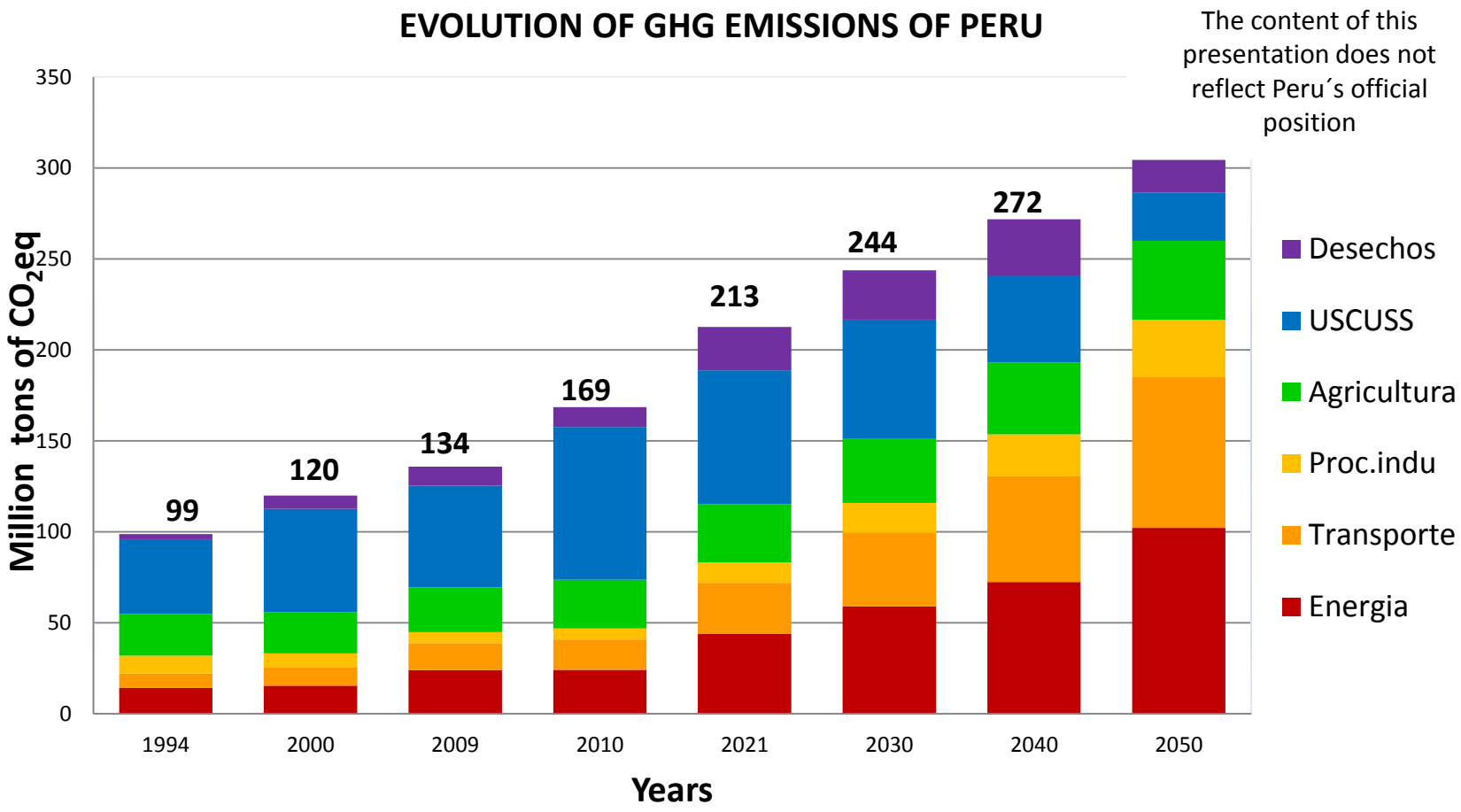
PlanCC - APOYO Consultoría

Key Challenges to model GDP and emissions (2)

BAU Emissions Scenarios

The content of this presentation does not reflect Peru´s official position

The content of this presentation does not reflect Peru´s official position



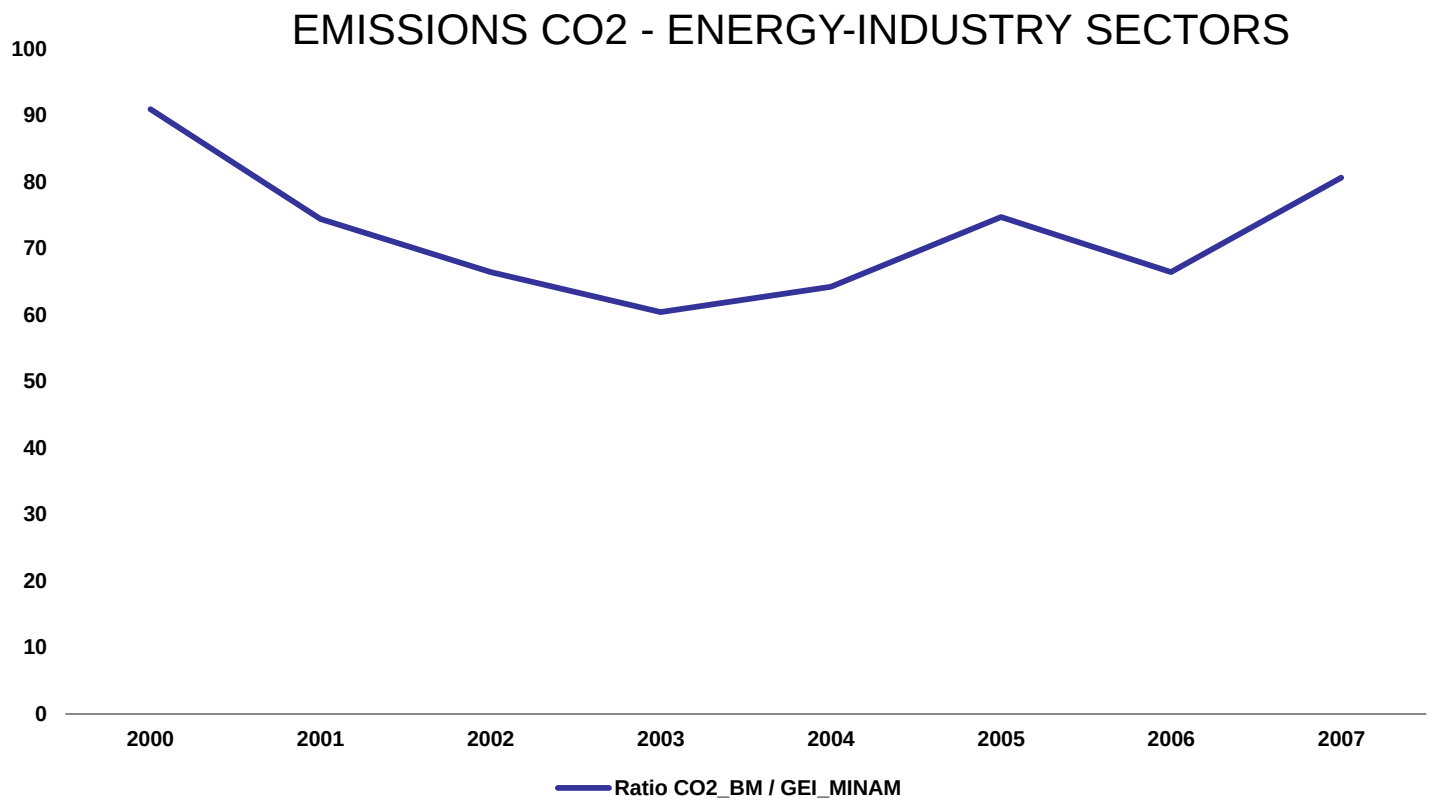
Key Challenges to model GDP and emissions (2)

The content of this presentation does not reflect Peru´s official position

1) WB database on emissions covers mainly energy, transport and industry (1960-2009
2) Had to deal with agriculture and Lulucf using FAO data (1990-2009)
3) Discrepancies with domestic data sources.

Data source discrepancies

The content of this presentation does not reflect Peru´s official position



Fuente: Banco Mundial, MINAM. Elaboración propia.

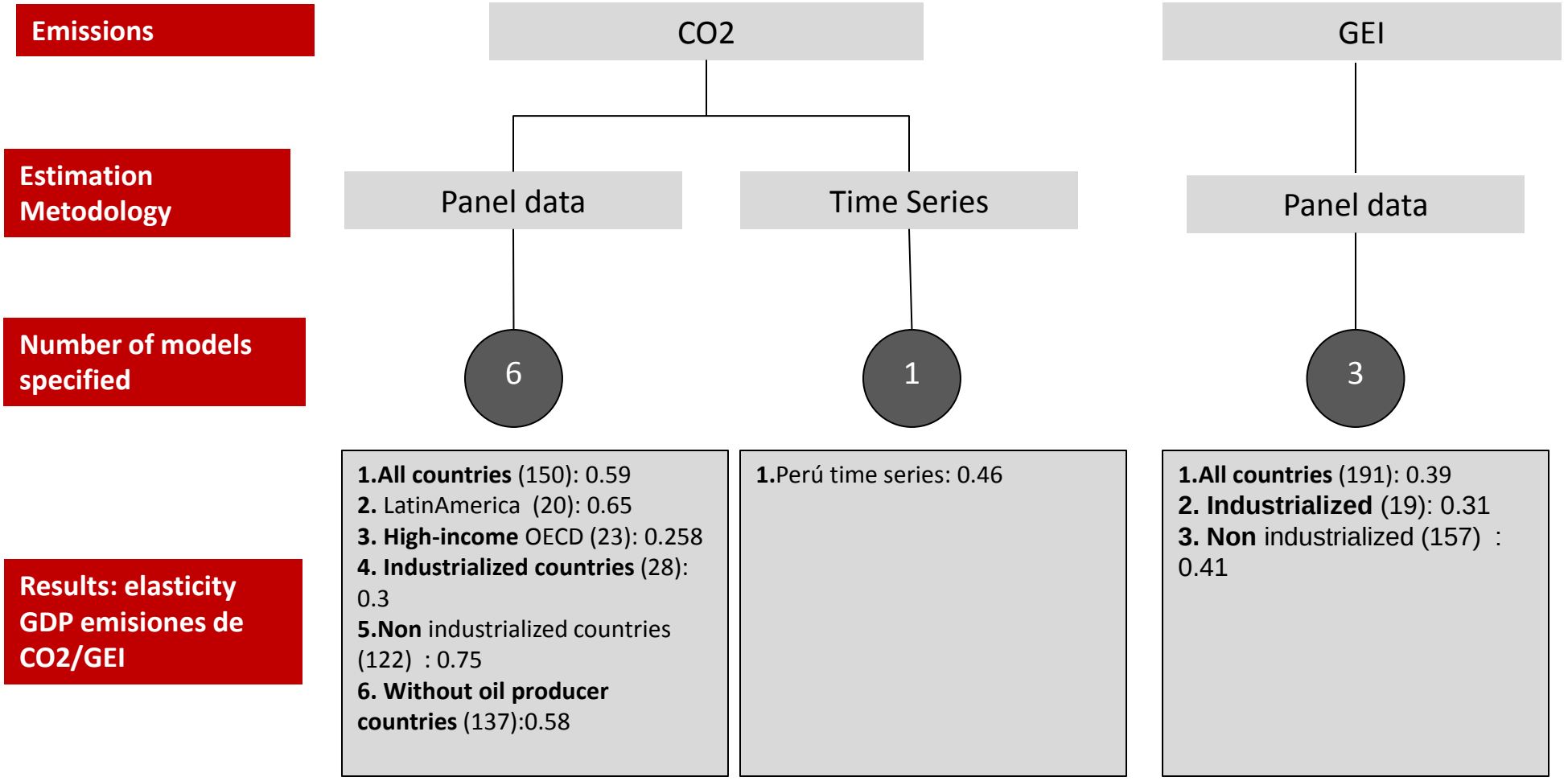
Top-down estimations (1)

The content of this presentation does not reflect Peru´s official position

	Industry and energy	Agriculture	LULUCF	Waste
				
Data sources available	MINAM World Bank	FAO	FAO/Ministry environment and agriculture	n.a.
Data Period	1960 -2009 anual	1990 -2009 anual	Two years: 1990 y 2009	n.a.
Drivers / Variables	GDP per cápita, density, GDP growth rate, plus a linear trend	% agriculture/GDP plus a linear trend	n.a.	n.a.
Metodología de estimación	Linear specification using panel data with fixed effects	Cubic specification using panel data with fixed effects	Historic growth rate	Historic share on emmisions according to MINAM

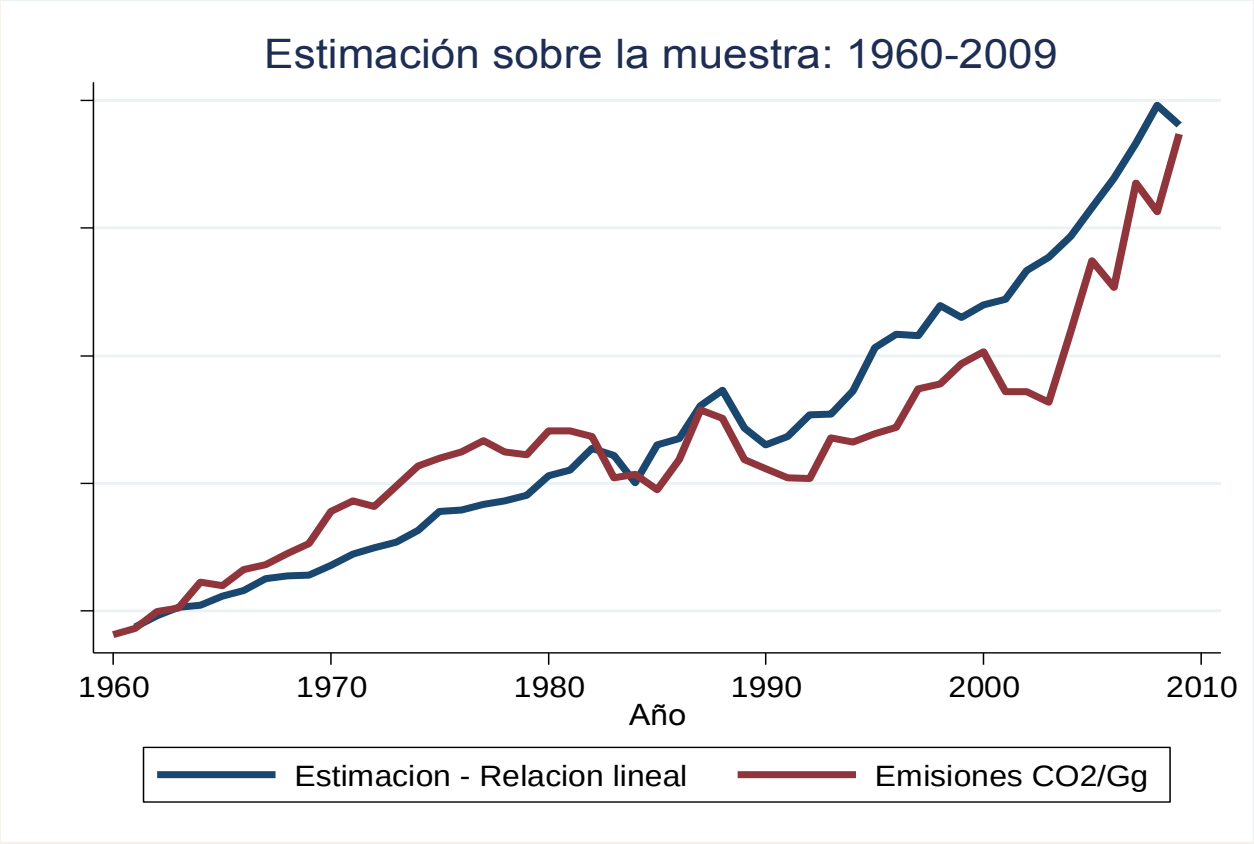
GDP Elasticity on Emissions Estimations

The content of this presentation does not reflect Peru´s official position



Reasonable fitted results on the data sample

presentation does not reflect Peru´s official position



Key Challenges to model GDP and emissions (2)

The content of this presentation does not reflect Peru´s official position

1) **Top-down "equity" scenario**

A country´s burden is estimated according to historic emissions, a capacity index, and its share of global population.

2) Peru´s burden turned out to be 0.51%.

3) Under an "equity" scenario, historic cumulative emissions data base do not seem to fit well with conventional wisdom.

2. **Bottom-up estimations**

Carried out by research sectoral teams using ad hoc methodologies but with the same main assumptions.

Useful input for modelling changes on carbon emissions intensities under the mitigation measures.

Projections discrepancies between top-down and borttom-up turned out to be low (5%)

Dealing with uncertainties

The content of this presentation does not reflect Peru´s official position

1) **Sensitivity analysis**
2) **More scenarios**
3) **Change model specification**

Domestic savings allocation comment

4**) Change data allocations assumptions on the SAM**.
SMEs returns are returns to labor or to capital?

In practice, still work to be done.

Applying the models in policymaking

The content of this presentation does not reflect Peru´s official position

1) **Usage**. Not very used in using formal empirical models in policy making.

2) **Sequence.** Contributions and negotiation phases are kicking in but models are not completely ready nor framed for conducting negotiations.

3) But probably good enough for voluntary contributions.

4) **Limitations:** coordination and alignment among public agencies.

5) Way out?: high-level political comittment