



QUANTIFYING LABOUR IMPACTS OF DECARBONIZATION STRATEGIES

Experts Advisory Services for the Inter-American Development Bank, Apr-Nov 2019



IDB's decarbonization pathways research program Investigate ways to make decarbonization policies politically acceptable

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UNFCCC, ILO, and UNDP

Regional workshop on “Tools and methodologies for modelling and assessing the impacts of the implementation of response measures” for Latin America and Caribbean region, Antigua and Barbuda, April 20-22, 2022

Day 2

Session 5: Regional studies using tools and methodologies for assessment on impacts of response measures

- Can net jobs be created in Latin America and the Caribbean while reducing carbon emissions?

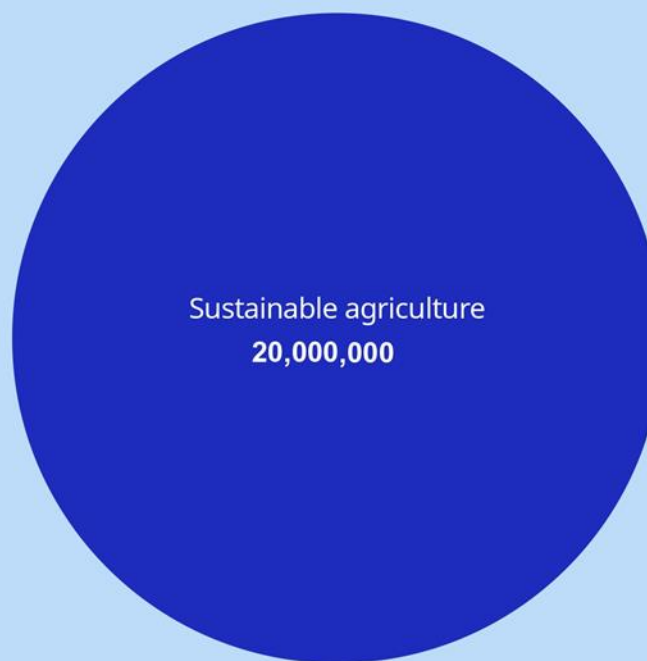
15 million net jobs

can be created by 2030 in the transition to a net-zero emissions future



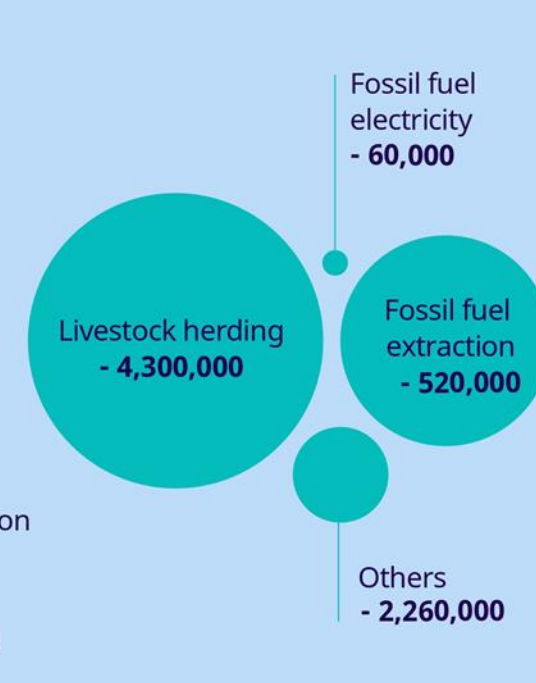
- Jobs created

+ 22,5 million



- Jobs destroyed

- 7,5 million



Project outcomes

Jobs in a Net-Zero Emissions Future in Latin America and the Caribbean



AUTHOR: Saget, Catherine; Vogt-Schilb, Adrien; Luu, Trang

DATE: Jul 2020

DOWNLOAD:  [English](#) (5702 downloads)
 [Spanish](#) (16291 downloads)

DOI: <http://dx.doi.org/10.18235/0002509>

Los signatarios del Acuerdo de París han acordado emprender iniciativas para limitar el calentamiento global a entre 1,5 C y 2 C. A la vez, los gobiernos están centrados en la recuperación económica y social con énfasis en la creación de empleo. Es crucial avanzar en todos los frentes.

<https://publications.iadb.org/en/jobs-in-a-net-zero-emissions-future-in-latin-america-and-the-caribbean>

https://www.ilo.org/global/docs/WCMS_752042/lang--en/index.htm

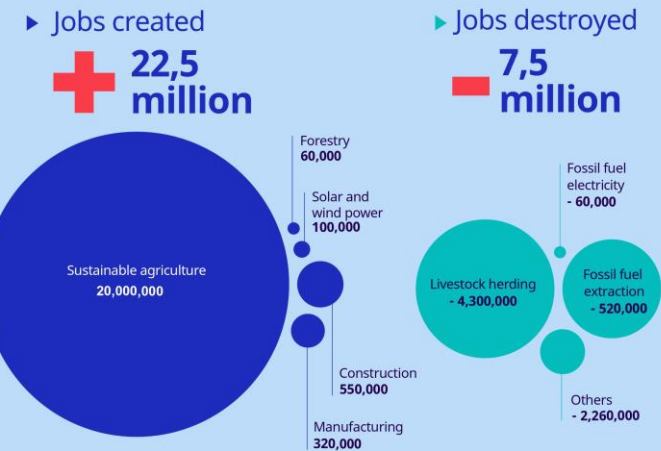


► Can net jobs be created in Latin America and the Caribbean while reducing carbon emissions?



15 million net jobs

can be created by 2030 in the transition to a net-zero emissions future



A just transition means



Ensuring that workers and enterprises have the skills needed and enjoy decent work conditions



Supporting workers, firms, and communities negatively affected



Social dialogue to design decarbonization plans

Post-COVID recovery plans should pursue both decent job creation and a transition to net-zero emissions

Source: IDB and ILO (2020) Jobs in a Net Zero Emissions Future in Latin America and the Caribbean

Research Questions



1. In each country, what would be the net impact on jobs during the transition from today's situation to a 2050 world consistent with the Paris Agreement objectives?
2. How many of today's jobs, in which countries and sectors, are at risk of becoming stranded during the transition to net zero emissions?
3. How many jobs, in which countries and sectors, could be created by 2050 during the transition to net zero emissions?

Focus on 20 Latin American and Caribbean countries

Decarbonization policies relevant for Latin America and the Caribbean

- **Energy transition**

- Increased energy efficiency
- Increased deployment of renewable energy technologies



- **Agriculture and land-use**

- Dietary changes: Eating less / no meat
- Changing technology in agriculture: extensive/intensive



'What-if' scenarios using **XLRM** method*

Given a set of **Exogenous Uncertainties X**

- Population
- GDP per capita
 - Food & energy per capita
- Labour productivity growth
- Exports



Considering different **Policy Levers L** available for reducing carbon emissions

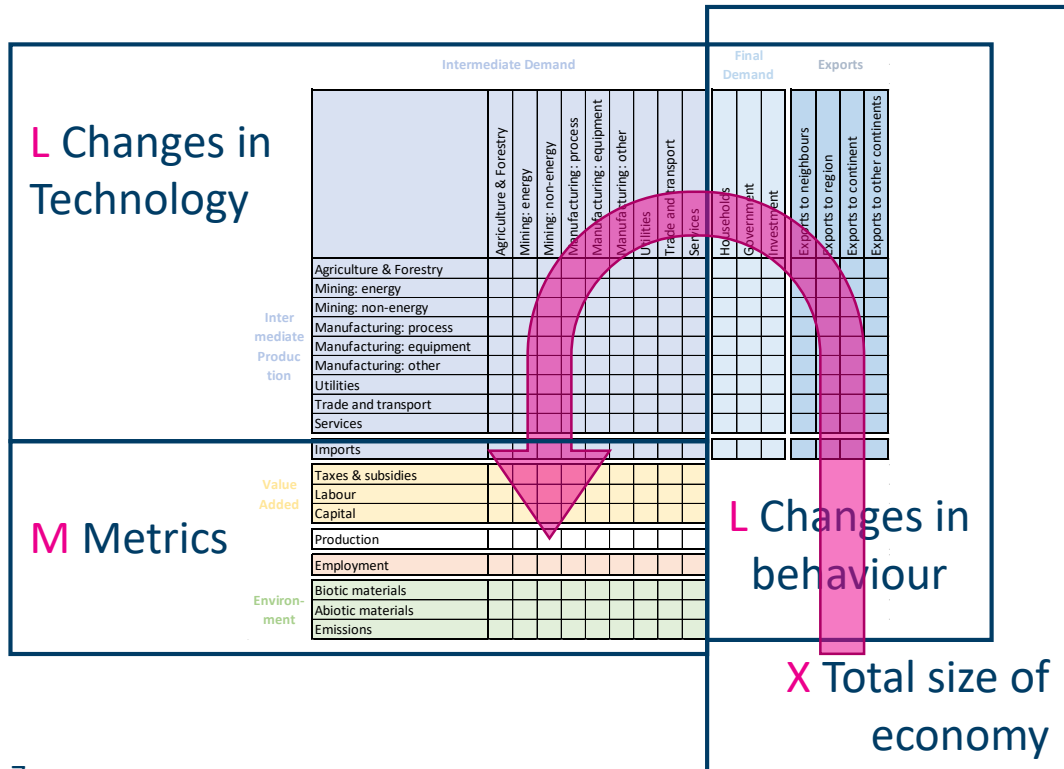
- Changes in behaviour
 - Dietary changes
 - Energy consumption
 - Investment in energy efficiency & renewable energy technologies
- Changes in technology
 - Agricultural production
 - Energy efficiency & Electricity mix
 - Transport (EV, biofuels)
 - Industrial processes



~ 100 Scenarios

'What-if' scenarios using **XLRM** method

Modelling **Relationships R** using
input-output (IO) analysis



Measuring the impact on different **Metrics M**

- Employment
by gender (and skills)
- GHG emissions
CO₂, N₂O, CH₄, deforestation
- Value added
Wages, Profit, Taxes

Pros and cons of the combined IO-XLRM approach

Pros:

- Input-output analysis is state-of-the art for macro-economic value chain and impact analysis
- Consistent framework for simultaneous assessment of changes in consumption behaviour and production technology
- Consideration of all indirect supply chain effects
- Empirically based
- Uncertainty analysis through XLRM
- Methodology can also be applied to other countries and regions

Limitations:

- Static input-output analysis
 - No factor constraints
 - No dynamic adjustments to constraints or changes in prices

Is there actually enough land to produce the biomass? Are hydroelectricity capacities available to satisfy the demand?

The analysis can show that there might be gaps in what is necessary and what is possible!

- Underlying data of economic structure
 - Level of aggregation

Approximation methods, if data is not detailed enough

- Uncertainties in data due to compilation methods

Data has widely been used in economic modelling, i.a. by OECD Trade and Agriculture Directorate

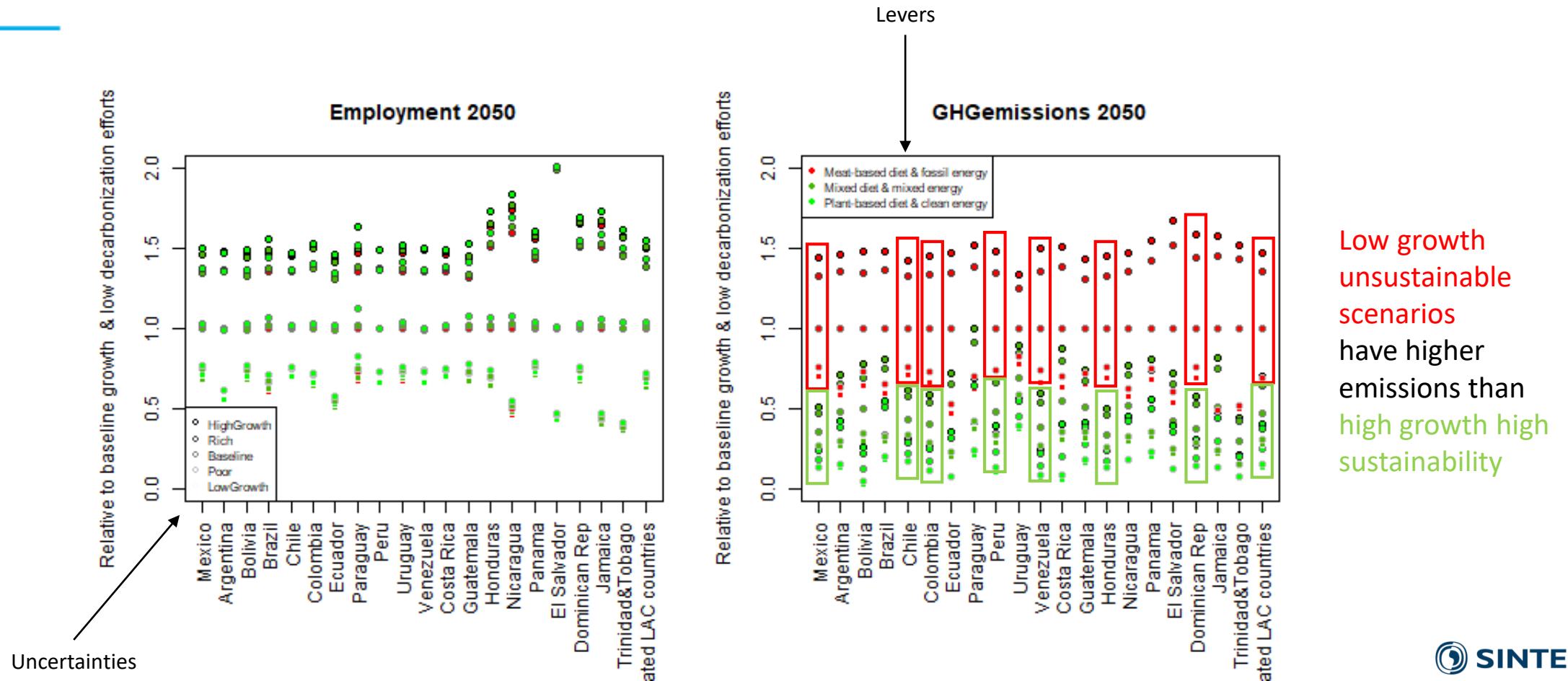
About 100 Scenarios =
combinations of uncertainties X & levers L

[illegible]

9

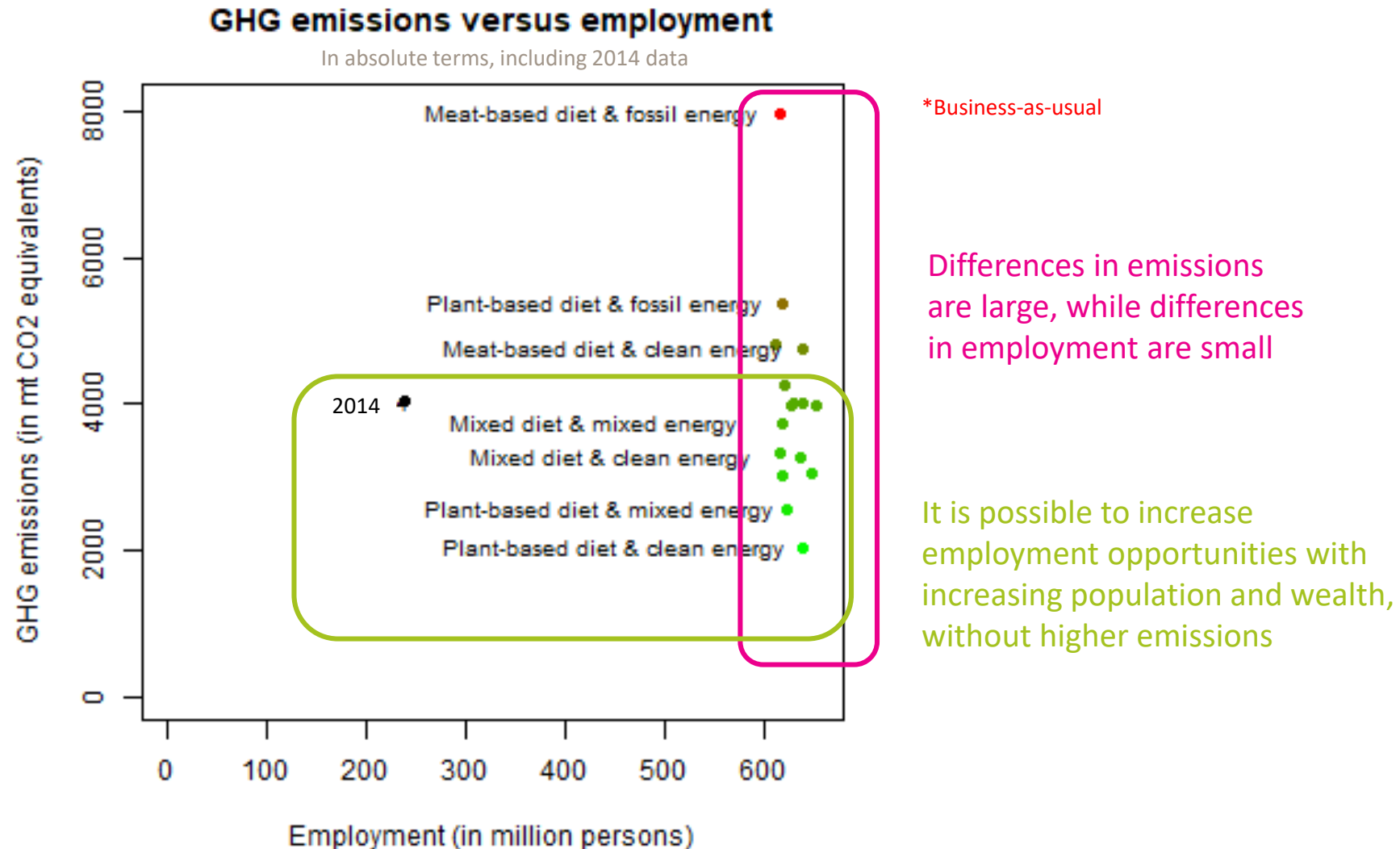
Uncertainties **X**: high, medium and low growth rates
Levers **L**: high, medium and low (direct) sustainability

RQ1: In each country, what would be the net impact on jobs during the transition from today's situation to a 2050 world consistent with the Paris Agreement objectives?



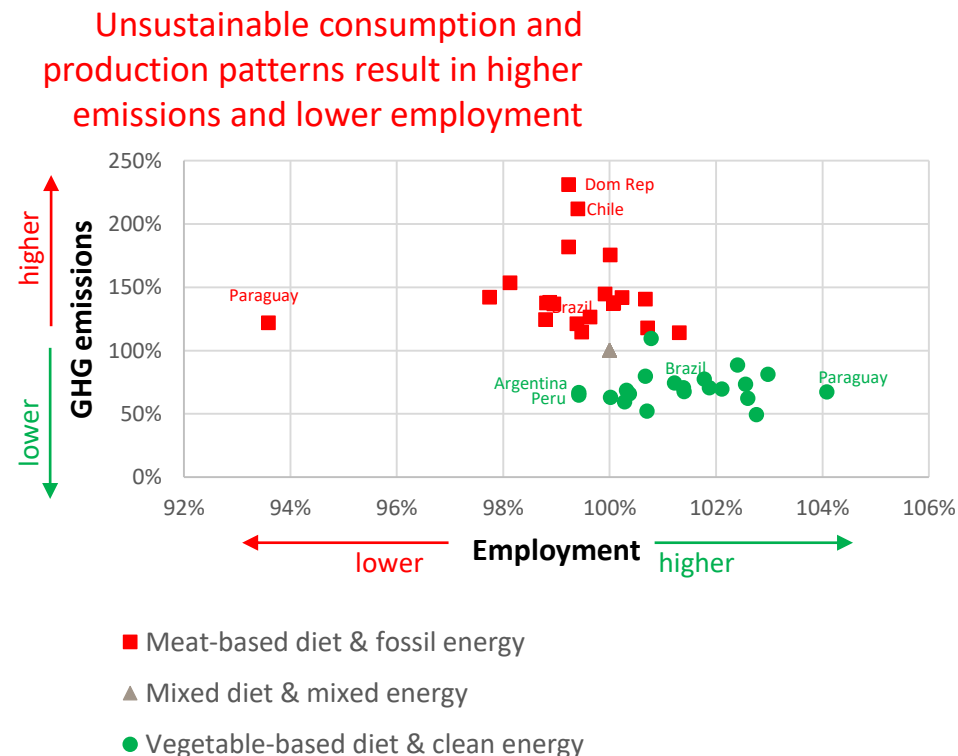
Latin America and the Caribbean (aggregate of 20 countries)

Employment and GHG emissions in different scenarios in 2050



RQ1: In each country, what would be the net impact on jobs during the transition from today's situation to a 2050 world consistent with the Paris Agreement objectives?

Employment and GHG emissions in 2050 relative to medium decarbonization efforts
= mixed diet and mixed energy
for 20 Latin American and Caribbean countries



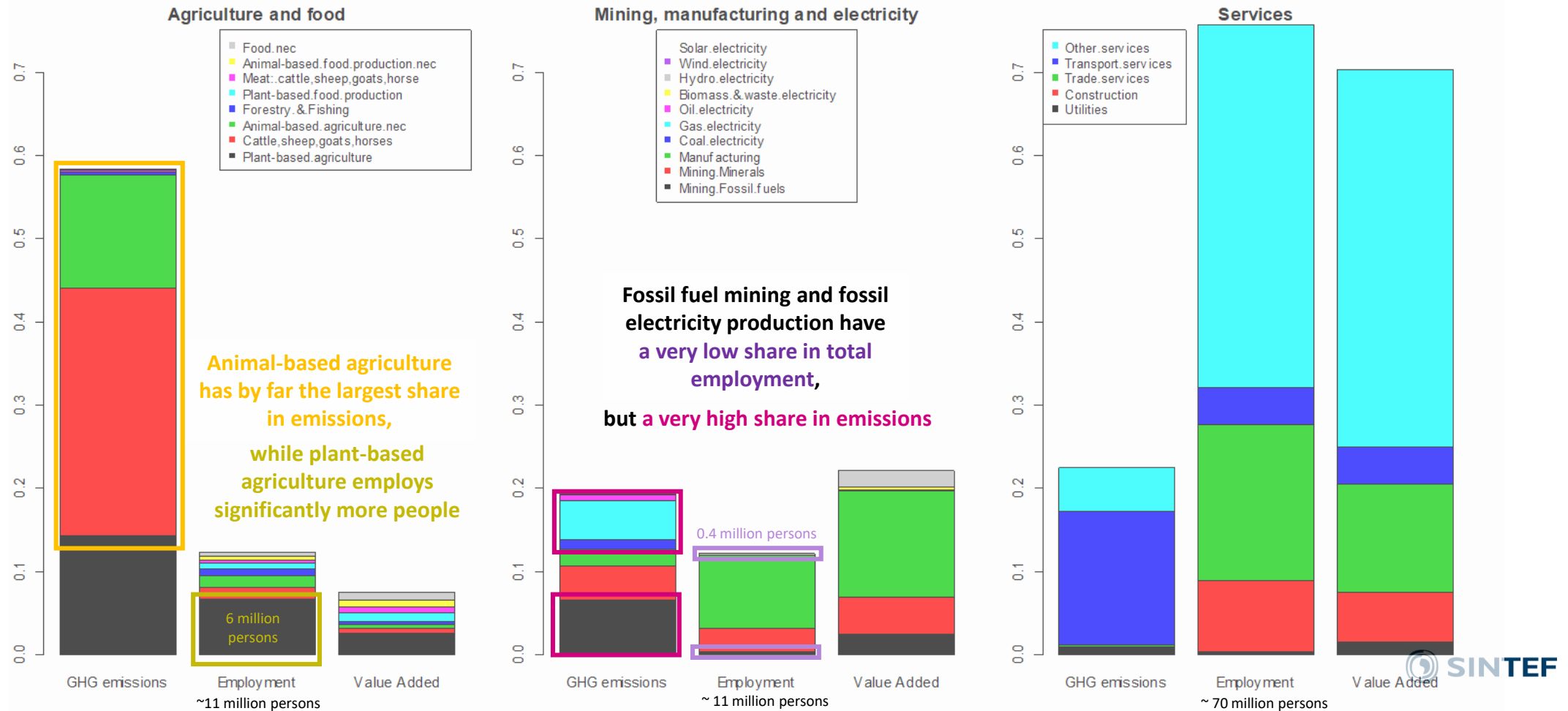
More sustainable consumption and production patterns result in lower emissions and higher employment

RQ 2 & 3: Sector specific results

RQ2: How many of today's jobs, in which countries and sectors, are at risk of becoming stranded during the transition to net zero emissions?

RQ3: How many jobs, in which countries and sectors, could be created by 2050 during the transition to net zero emissions?

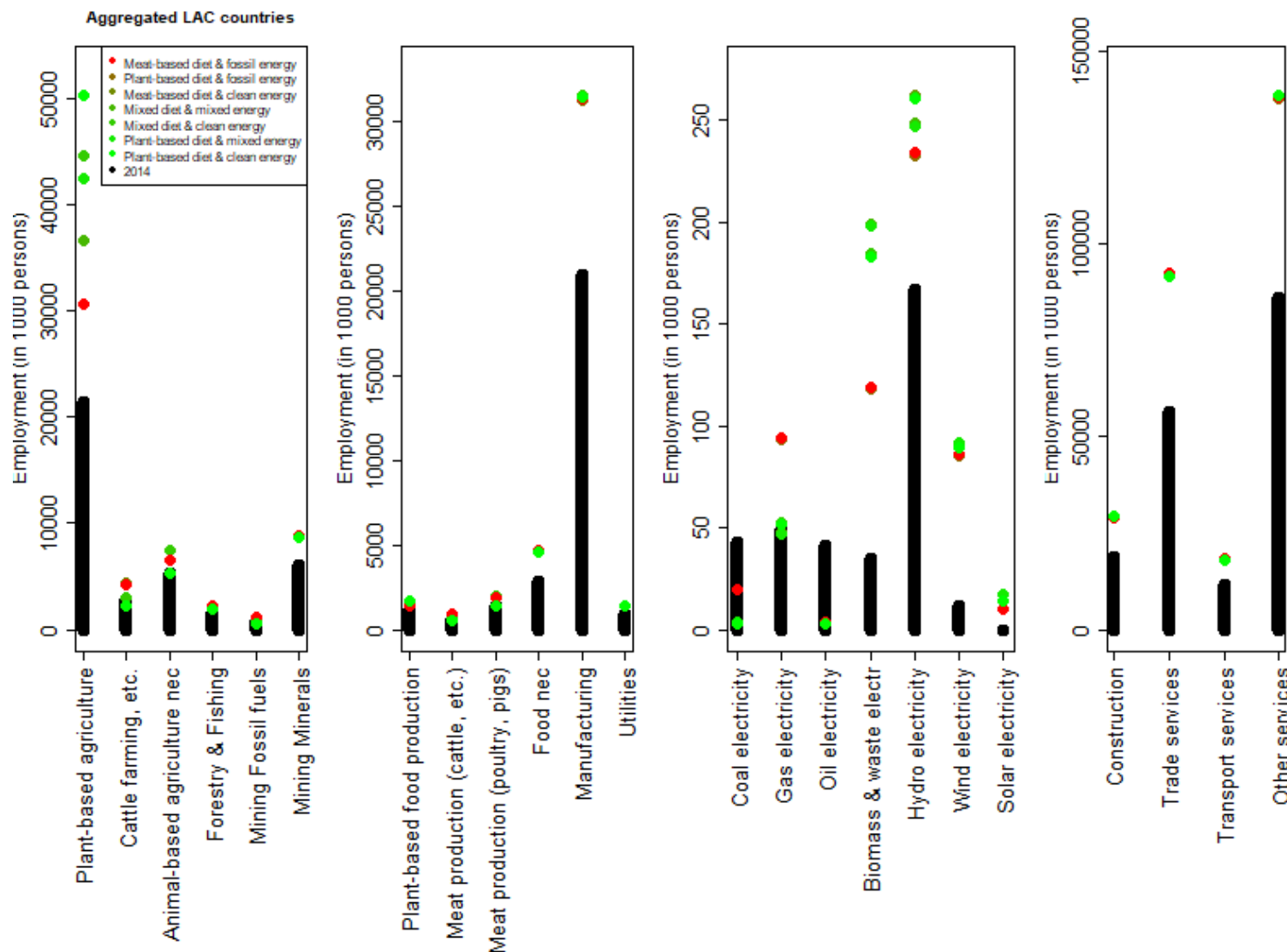
GHG emissions, employment and value-added shares by industry in 2014 for aggregated industries in Brazil



RQ 2 & 3: How many jobs, in which countries and sectors, are at risk of becoming stranded / could be created during the transition to net zero emissions?

Employment in mining and utility industries is relatively low compared to agriculture and services

Employment effects are largest in agriculture and food production in absolute terms



Direct & supply chain effects

Positive

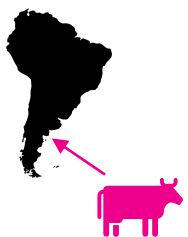
- Plant-based food + upstream
- Renewable energy technologies

Negative

- Meat-based food + upstream
- Fossil energy

Project results & policy implications

RQ2: How many of today's jobs, in which countries and sectors, are at risk of becoming **stranded** during the transition to net zero emissions?



- Identification of regions, industries and population groups at risk
- Design of flanking measures to minimize negative impacts, e.g. which other industries can be settled in the effected region?

RQ3: How many jobs, in which countries and sectors, could be **created** by 2050 during the transition to net zero emissions?

- Identification of regions and industries that are growing
- Skills and occupations demand
- Education & retraining of workforce
- Infrastructure investments



Disclaimer/Limitations

- The longer in the future, the less certain are the results, especially considering that there might be large changes in economic structure (digitalization, Industry 4.0, circular economy transition) and international trade that we do not consider.
- As the analysis with respect to uncertainties showed, both employment and emissions strongly depend on the absolute size of the economy, small differences in annual growth rates, can result in big differences in levels 30 years from now.
- We advice to use the results in a qualitative way to indicate direction and scale of the impacts, but not exact numbers, s.a. number of jobs created/lost to the last digit.
- We show the effect in a year (flow), not the cumulative effect on emissions and employment (stock).



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