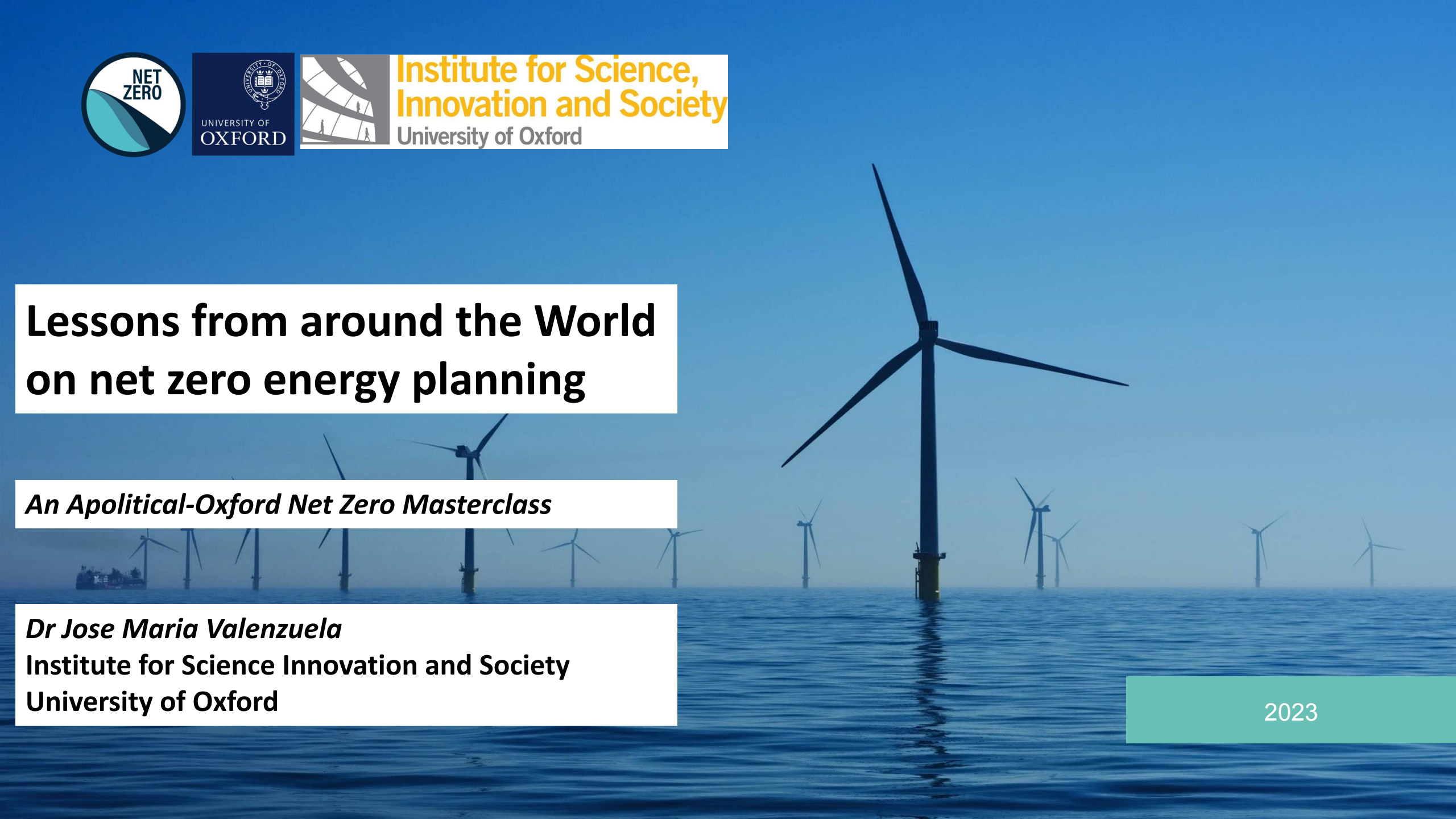

Lessons from around the World on net zero energy planning

An Apolitical-Oxford Net Zero Masterclass

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Climate Change Agenda at Subnational Level in Mexico: Policy coordination or policy competition?

Jose Maria Valenzuela*

Clean Restructuring: Design Elements for Low-Carbon Wholesale Markets and Beyond

A 21st Century Power Partnership Thought Leadership Report

Monisha Shah[1], José María Valenzuela[2], Héctor Alejandro Beltrán Mora[3], Kim Møller Porst[4], Anders Hasselager[4], Sandra Friis-Jensen[4], Mette Vingaard[4], Fabian Wigand[5], Silvana Tiedemann[5], Lori Bird[1], Owen Zinaman[1], and Jeffrey Logan[1]

Contents lists available at ScienceDirect

World Development Perspectives

journal homepage: www.sciencedirect.com/journal/world-development-perspectives

State ownership in liberal economic governance? De-risking private investment in the electricity sector in Mexico

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Net zero planning

is the result of
is a challenge to
is not related to

Energy planning

Energy planning

is the result of
is a challenge to
is not related to

Net zero planning

Are energy planning and net-zero planning related?

- Energy models are used to develop net-zero pledges. But having a net zero pledge is not the same as net-zero planning.
- It is common for climate commitments to be made first, before reaching official energy planning –especially as climate commitment are long-term.

Minding the uses of planning

Three ways to think of Energy planning

1.
Optimize investment and operation

- Short cycles or annual reviews.
- Done by the Utility and/or a state authority.
- Collapse uncertainty into specific parameters

Three ways to think of Energy planning

2.
Test hypothesis (desired states)

- Key changes in the past or expected trajectory.
- Commonly done by academics, NGOs, some authorities and some private companies.
- Set and agenda, call for action or developed a share vision.

Three ways to think of Energy planning

3.
Explore uncertainty

- Occasional exercises with very broad scope.
- Consider many dimension (social, political, environmental, economic).
- Create debate, deliberation and reflection about what we don’t know and what we can do about it.

Energy planning serves us

- To make investment choices.
- To know what future conditions, risks, challenges and opportunities are coming.
- To design new policies or modify current regulation to anticipate problems.
- To understand our current situation better (by looking at what can be different)

Chile's net zero target and Long-term Climate Strategy

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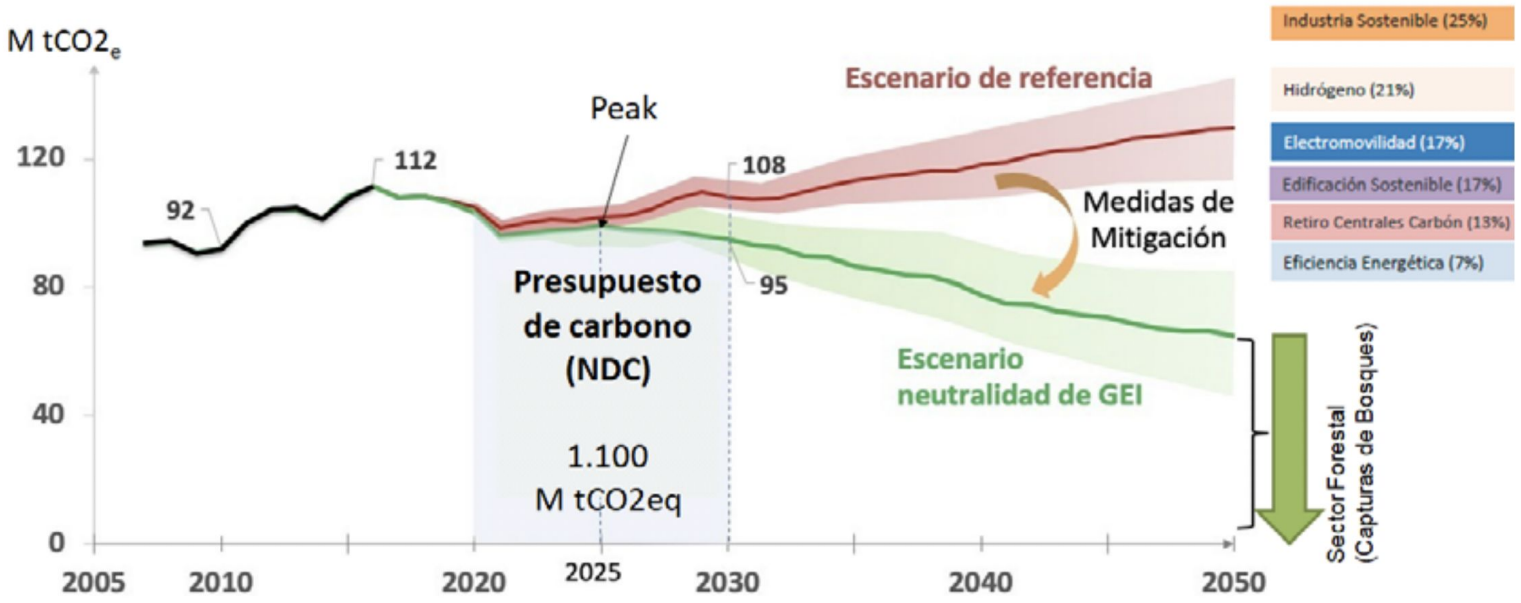
Chile's Long-term Planning

Long- Term Climate Strategy (in Spanish)



How does Chile reach net zero by 2050?
50% emissions reduction
50% carbon sinkins

Mitigation (100%)
Industry (25%)
Hydrogen (21%)
Electromobility (17%)
Buildings (17%)
Coal power phase down (13%)
Energy efficiency (7%)

With a carbon budget "lock".

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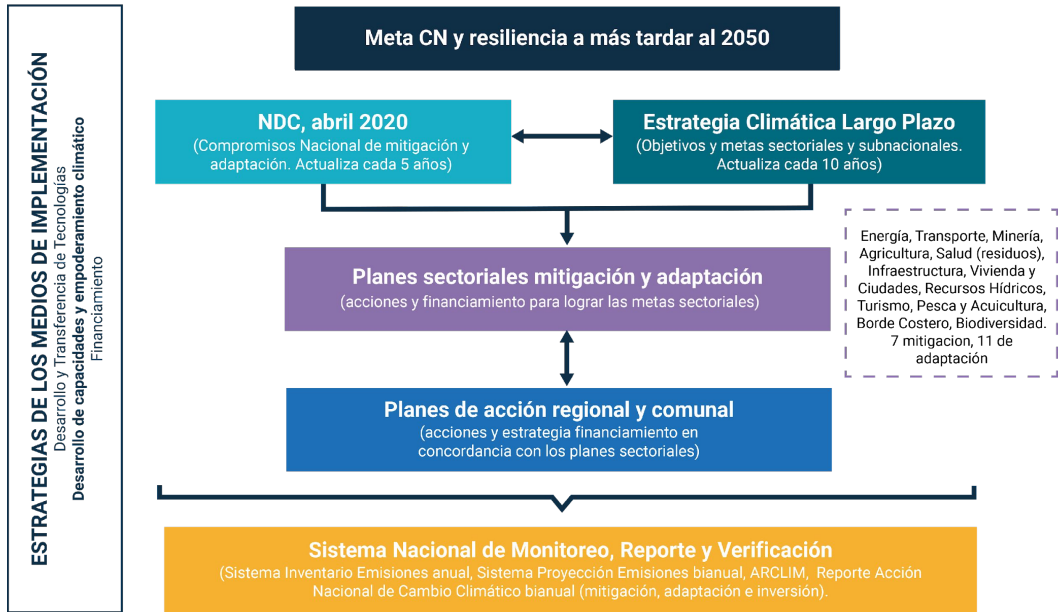
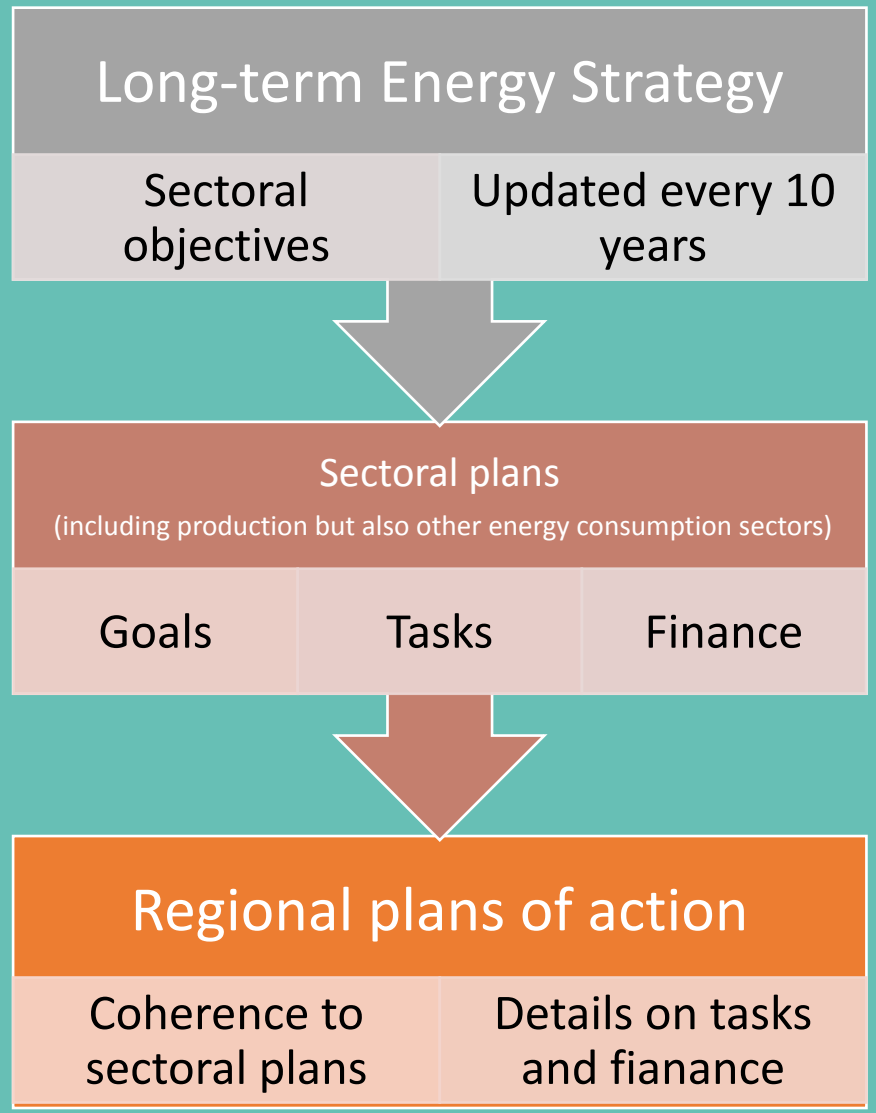
Chile's Long-term Planning

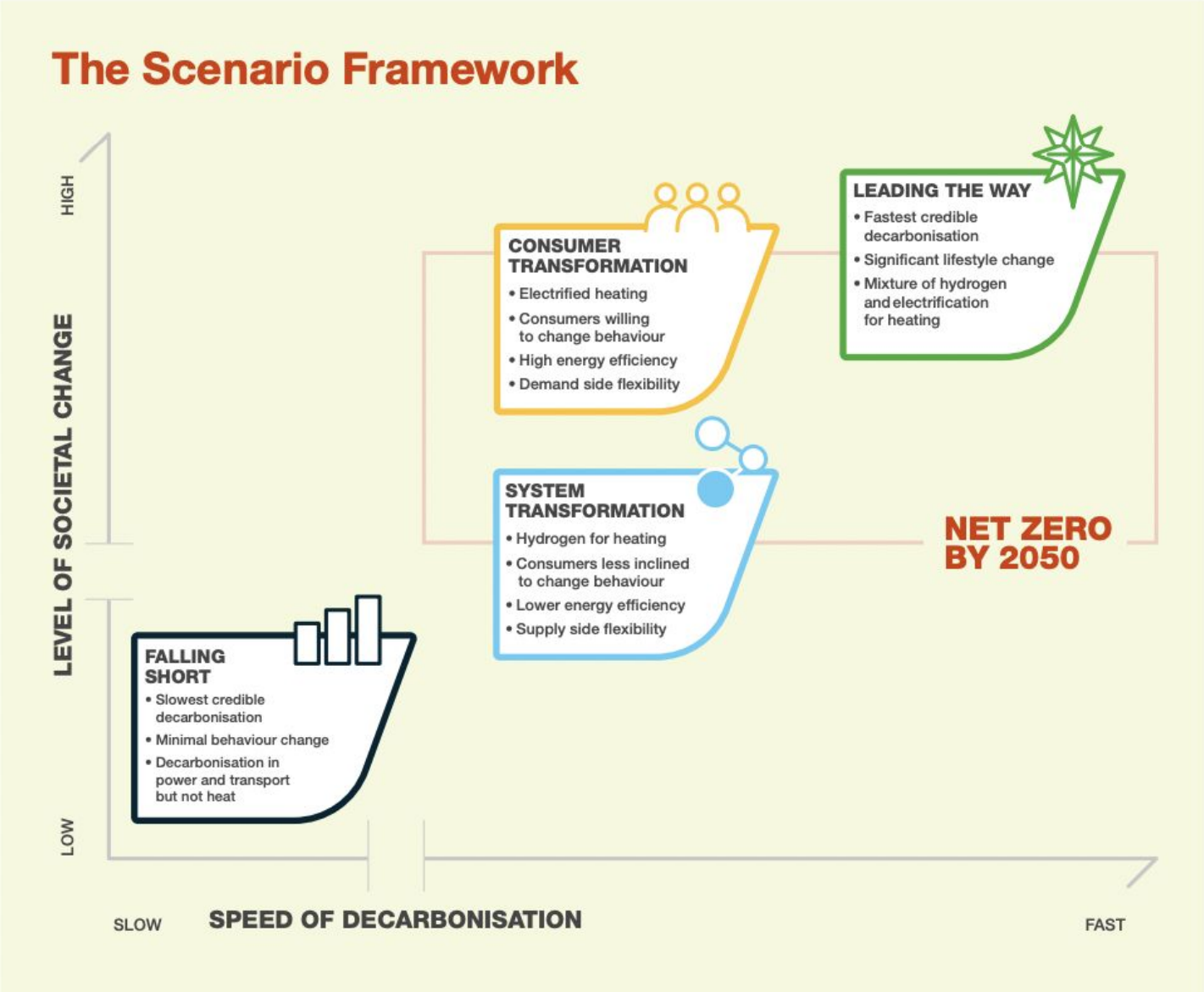
Long- Term Climate Strategy (in Spanish)





UK Future Energy Scenarios and Net Zero planning

UK Future Energy Scenarios



- Developed by the System Operator, the ESO, soon to be called Future System Operator (FES).

- Exploration of multiple dimensions, for example, how much do people change their consumption behavior.

- Regional dimensions to consider were we would expect future energy demand and of what kind.

- Consider very different energy development futures.

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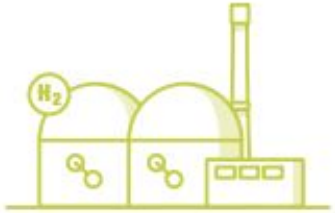
UK Future Energy Scenarios

Hydrogen and gas CCUS power generation capacity reaches 12.3 GW by 2035 in System Transformation

Residential heat pump installations range from 0.3 million to 1.5 million per year across all scenarios in 2030



12-56 TWh of inter-seasonal storage is required aross our net zero scenarios in 2050

Removal of BECCS and DACCS from our net zero scenarios leaves residual emissions of 18-49 $MtCO_2e$ annually in 2050

https://www.nationalgrideso.com/future-energy/future-energy-scenarios

Examples of key uncertainties:

- Hydrogen and CCUS
- Residential forms of demand (heat pumps)
- Intersessional storage requirements.
- The extent of necessary carbon removal.

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UK Future Energy Scenarios

Scenarios can help us assess changing government policy

Example:
UK government announced moving the ban on new sales of petrol and diesel cars and vans from 2030 and 2035.

CT Consumer Transformation LW Leading the Way
ST System Transformation FS Falling Short Policy

		2022	By 2030	By 2035	By 2040	By 2045
Transport	Sales of petrol and diesel cars and vans banned	1.6m petrol and diesel cars and vans sold	CT LW	ST	FS	
	Zero tailpipe emissions for all new cars	7% of cars sold		CT LW ST	FS	
	Zero tailpipe emissions for all new HGVs	<1% of HGVs sold			CT LW ST	FS

https://www.nationalgrideso.com/future-energy/future-energy-scenarios

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Los Angeles 100% Renewable Energy Study

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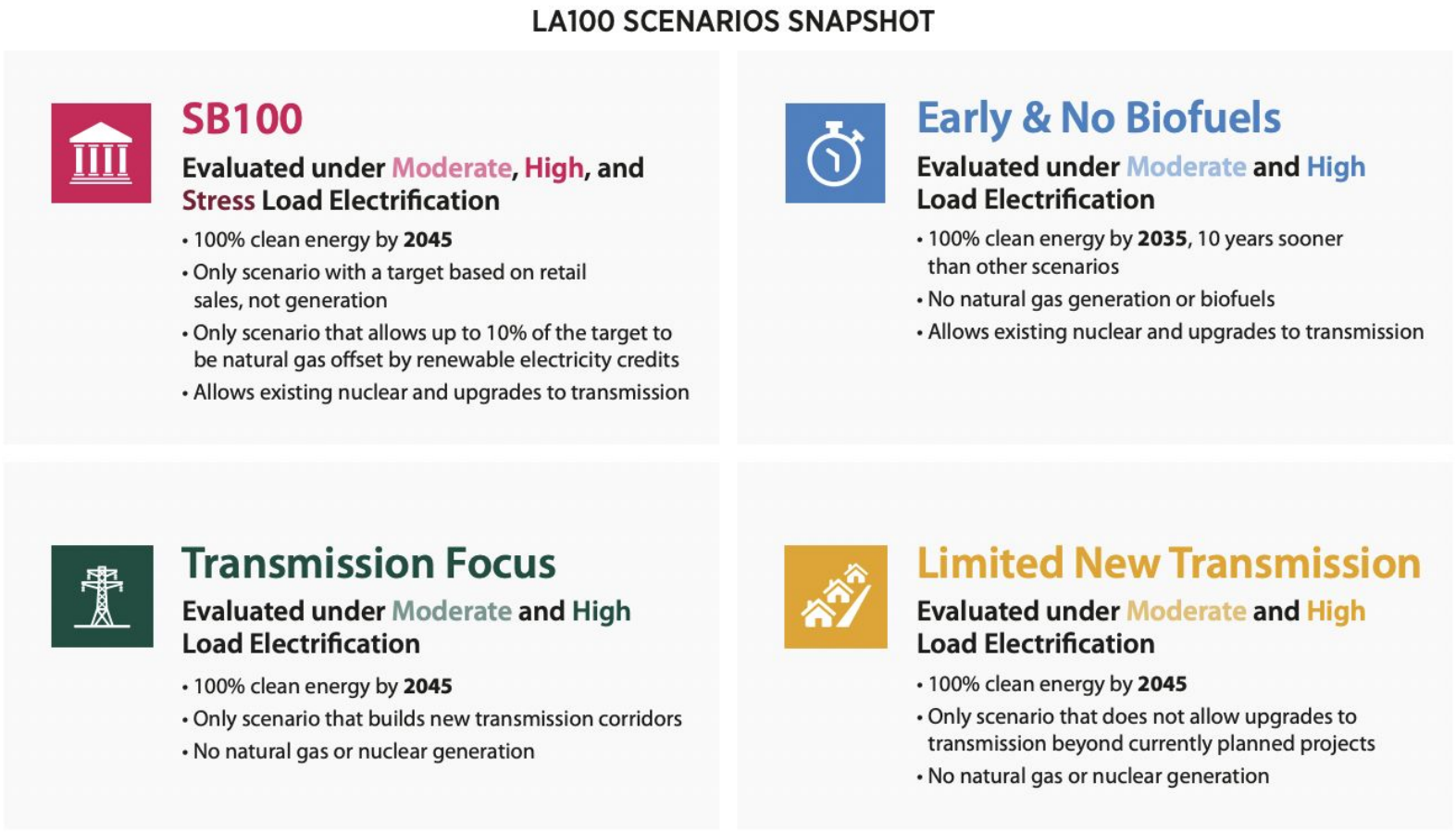
LA100
The Los Angeles 100% Renewable Energy Study



https://maps.nrel.gov/la100/

- Explore how feasible it is to have a 100% renewable energy supply for the metropolitan region.

- Include the all forms of energy consumption, including housing and transport.

- 90% of renewable energy supply is cost competitive, beyond that it will become more costly for expansion.

- Developed by the National Renewable Energy Lab.

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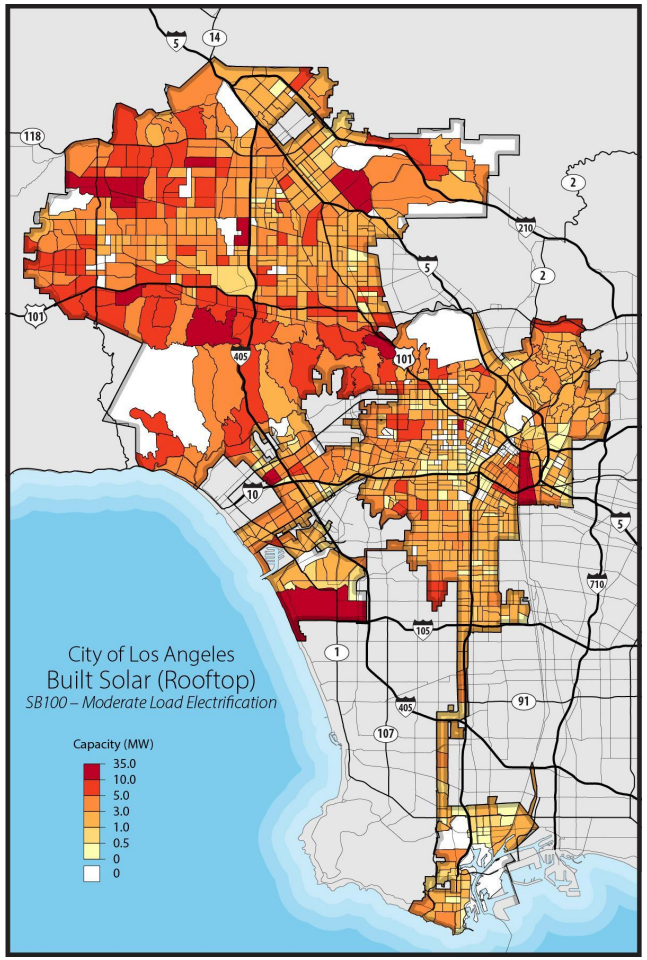
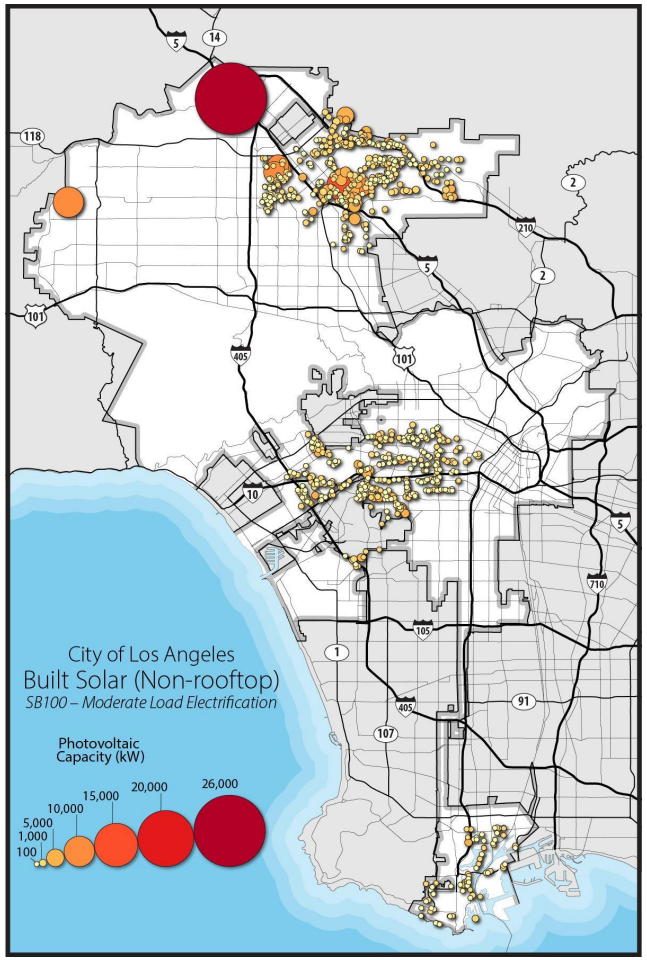
LA100
The Los Angeles 100% Renewable Energy Study





https://maps.nrel.gov/la100/

- The key is to explore the topic that are really important for the users. Is it a local government? A national utility?

- Can the system sustained more distributed solar?

- What does the lack of new transmission infrastructure changes the configuration of the system?

- How to best address key inequalities within the city?

The questions arise from local stakeholder participation too.

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International collaboration: the case of China

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China Renewable Energy Outlook

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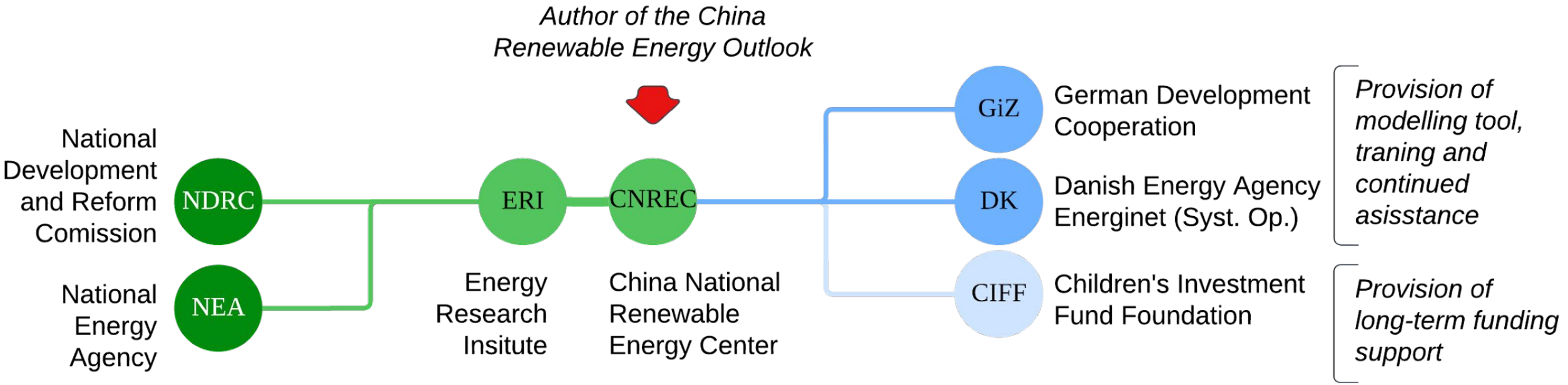

The case of China Renewable Energy Outlook (CREO)

Model integration. Tools developed for Denmark are combined with domestic models from Government and the Grid Company. Results are communicated in yearly China Renewable Energy Outlook (CREO).

Institutional learning. Academic research and program design must: (a) Identify actors given overlapping roles in policy, planning, and industrial operation; and (b) identify role (and strengthen) the local knowledge broker.

Summary

- Energy planning is necessary to describe the implication of net-zero targets.
- But net-zero targets do not resolve the many uncertainties and to achieve it.
- Energy planning should be used to explore uncertainties and possibilities.
- Scenarios are a useful approach to explore diversity.
- Scenarios are also good to interpret policy direction or even social change.
- International collaboration is important, but make sure that its about developing capabilities, not getting a product.

Thank you

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