

# Scene setting presentation



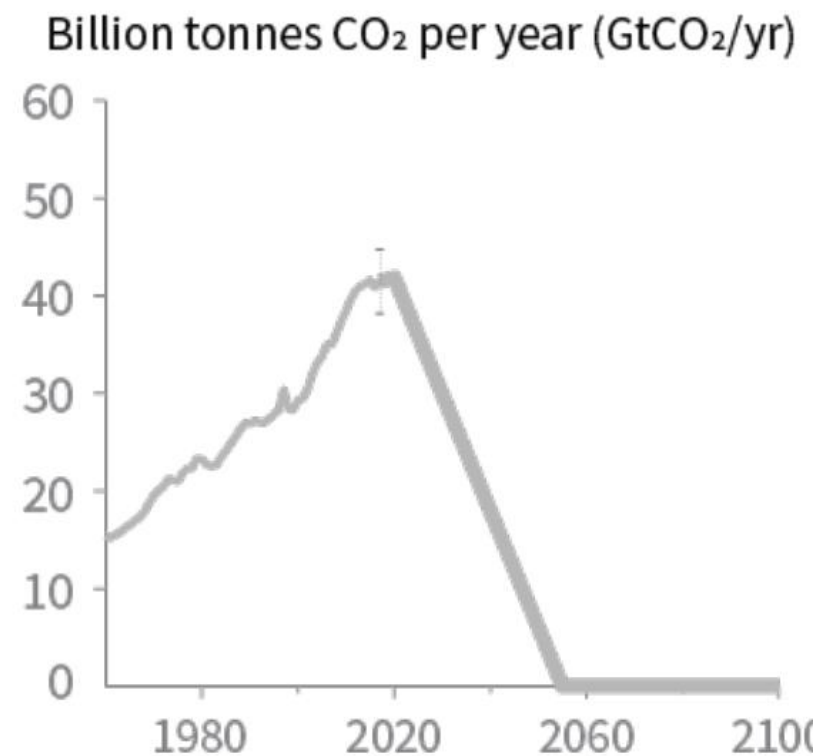
# Net-zero scenarios for national energy planning

## Global

**Net-zero CO<sub>2</sub> emissions by around 2050**  
**Net-zero GHG emissions by around 2070**

## National

**National net-zero strategies: LTES**



Source: IPCC

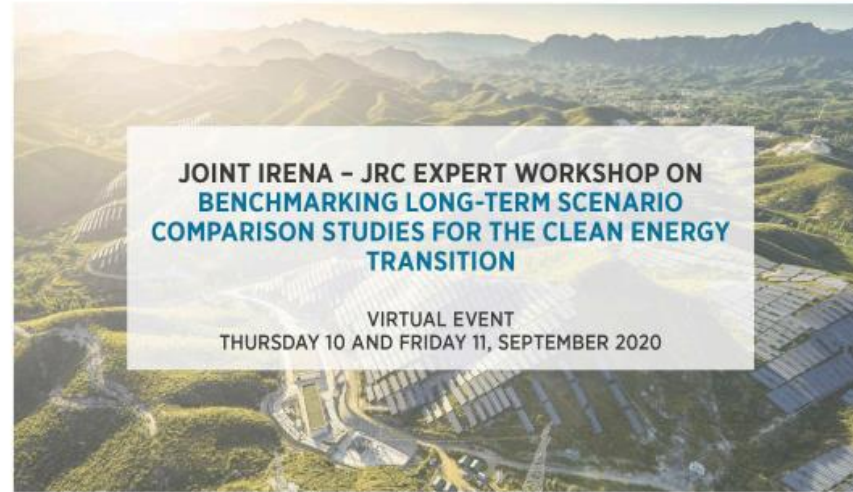
# Long-term energy scenarios for clean energy transition network

## Net-zero questions for national scenario making

- Direct electrification vs indirect electrification
- Biofuel vs renewable power
- Sector coupling and roles of infrastructure
- Digitalization and behavioral change
- Energy security and resilience
- Alignment of national and international strategies
- Critical materials
- Just and inclusive transition



# Experts insights from scenario comparison studies



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# Experts insights from scenario comparison studies



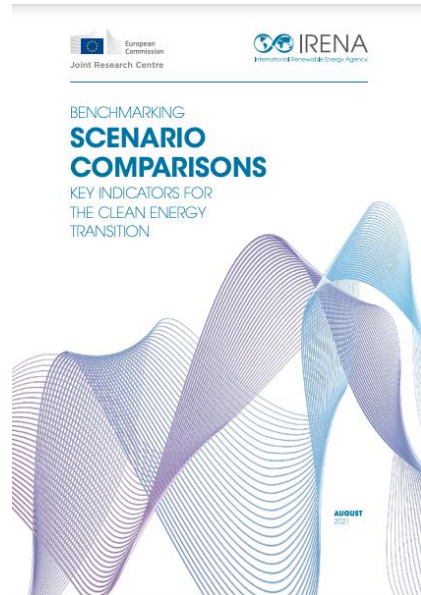
## Common trends

- Power sector decarbonization with renewables
- Electrification of buildings, transport and industry
- Policies and technology success as key determinant of scenarios

## Mixed view

- Degree of the end-use electrification
- Choice among alternative electrification strategies
- Energy consumption behavior

# Expert opinion on making net-zero scenarios more policy relevant



## Scopes

- Disruptive changes on the demand side
- System wide innovation
- Consumer behavior
- societal adaptations of policies

## Methodologies

- Big models have a stronger supply side
- Inherently difficult to assess the end-use sector
- Putting scopes and narratives around scenarios

# Technology avenues in IRENA's net zero scenario

Renewable power

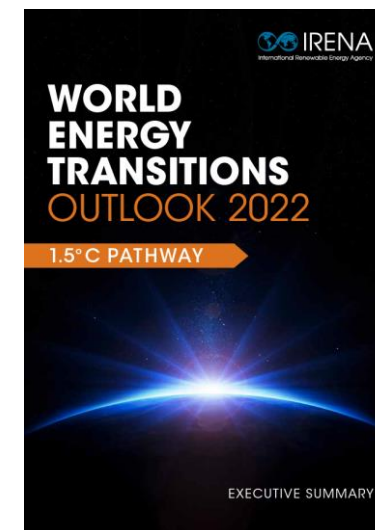
Energy efficiency

Direct  
electrification

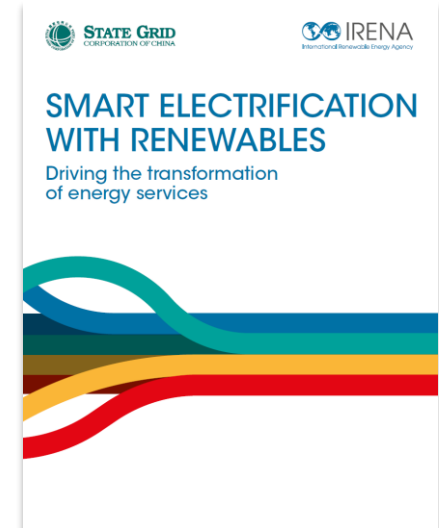
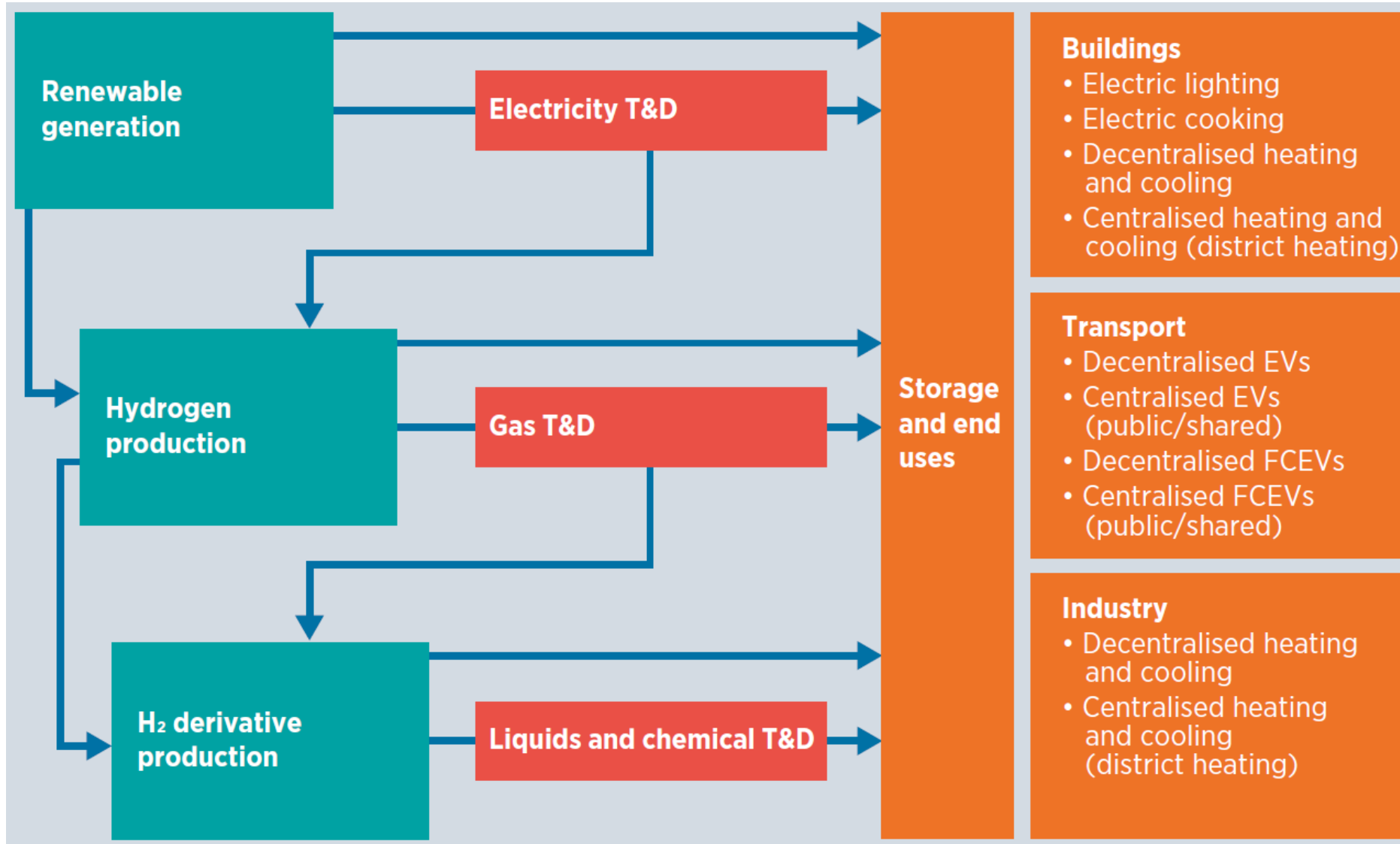
Direct use of  
renewables

Hydrogen and its  
derivatives  
(indirect  
electrification)

CCS and CDR

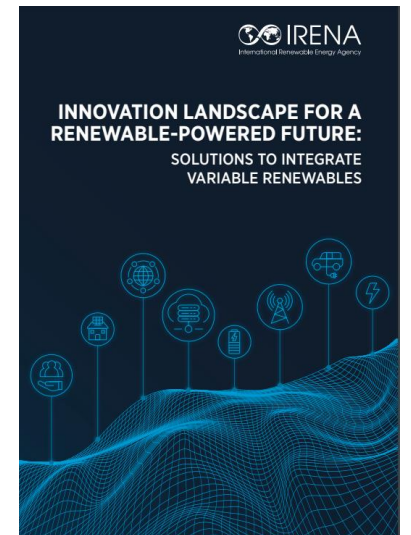
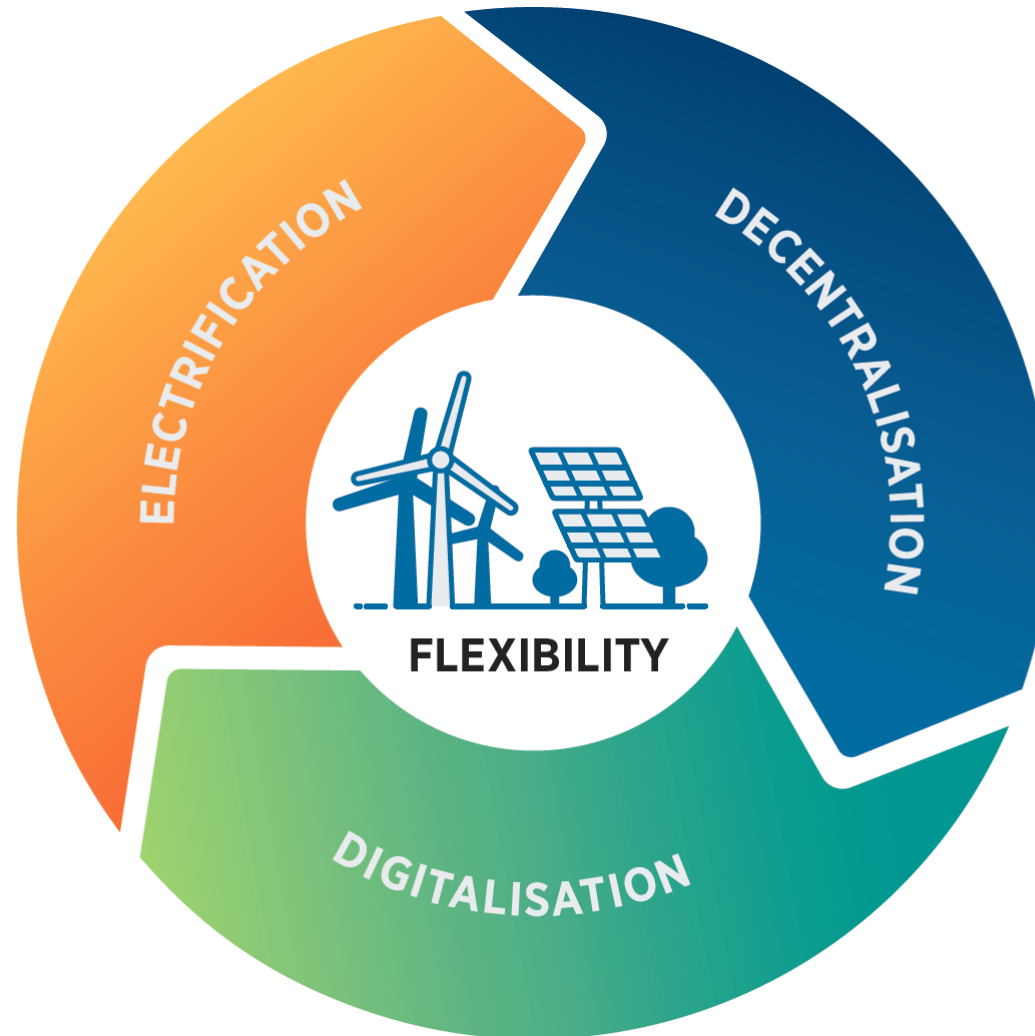


# Unpacking the electrification pathways





# Unpacking innovation



# Challenges for the national energy planners

- Planning time horizon
- Scope of decarbonation
- Scopes of options – strong focus on supply side options
- Increasing complexity of analysis – set up of national planning “eco-system”

**ENERGY PLANNING DOCUMENTS AND MODELLING TOOLS**

This dashboard shows modelling tools used by governmental and technical institutions in developing their planning documents.

**DATA COLLECTED**  
34 Countries    39 Planning documents

Filter by country: All | Filter by region: All | Filter by planning document scope: All

Country	Planning document	Responsible institution	Planning horizon	Year of publication	Planning document scope	Modelling tools used	Modelling scope			Verified by country
							Energy system	Power capacity expansion	Demand assessment	
	Plan 11	Botswana			system	IMAED, WASP				
Brazil	Plano Nacional de Energia 2050 (PNE 2050)	Ministério de Minas e Energia	2015-2050	2021	Energy system	MIPE2, MSR, MELP, MESSAGE, In-house EPE model	●			
Cameroon	Assistance au Ministère de l'Énergie et de l'Eau dans l'élaboration du Plan de Développement long terme du Secteur de l'électricité Horizon 2030 (PDSE 2030)	Ministère de l'Énergie et de l'Eau	2008-2030	2006	Power system	Logos		●	●	
Canada	Canada Energy Future 2021	Canada Energy Regulator (CER)	2020-2050	2021	Energy system	ENERGY 2020	●		●	
Chile	Planificación Energética de Largo Plazo	Ministerio de Energia	2018-2022	2019	Energy system	LEAP, PCP/PLP, Ameba	●	●	●	
Colombia	Plan De Expansión De Referencia Generación	Unidad de Planeación	2015-2029	2015	Energy system	In-house model,	●	●	●	

National Energy Transition Planning Dashboard