Policy packages for energy transitions

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Multiple objectives of clean energy transitions

- Energy Sector Transitions
  - Are critical for achieving
  - Are not the only (or primary) driver of
- GHG targets
  - Lower energy costs
  - Jobs and growth
  - Energy security
  - Air quality
A broad basket of policies is relevant for energy transition: policy overlaps and interactions need to be taken into account for effective implementation.
Different country contexts will lead to different policies playing different roles in line with policy priorities; their “size and shape” may vary and evolve over time.
Optimising for short- and long-term reductions?

A policy package for long-term transition may contain different elements than one for a shorter timeframe.

Source: Perrissin and Foussard., 2016
The time dimension of policy packages: Tailoring to timeframes

Objective – depending on the stage of transition

Technology: Drive transition to clean modern, efficient and resilient energy system

Climate: Achieve peak emissions → Absolute emission reductions → Toward net-zero emissions

Short-term

- Deploy low-carbon technologies and energy efficiency
- Fuel switching
- Establish low-carbon financing models

Medium-term

- Deploy low-carbon technologies and energy efficiency at large scale
- Phase out existing carbon-intensive infrastructure
- Moderate to high carbon prices [OR alternative policies]
- Embed low-carbon financing environment

Long-term

- Energy system-wide deployment of low-carbon technologies and negative emissions
- Phase-out of existing high-carbon infrastructure
- Favourable financing environment for low-carbon
- High carbon prices [OR alternative policies]
- RD&D investment for the next generation of technologies

Preparing for the future

- RD&D for low-carbon and negative emission technology
- Planning for energy transition
- Invest in supporting infrastructure
- Prevent lock-in
Sustainable energy transition: Domains of policy packages

1st Domain

- Policy objectives:
  - Improve economic choices to enhance efficiency of energy use
  - Remove non-economic barriers to unlock cost-effective energy efficiency potential

- Policy choices:
  - Standards, regulations and better consumer information driving behavioural shifts
  - Incentives for improved energy efficiency and energy conservation

2nd Domain

- Policy objectives:
  - Drive selection of lower-carbon products and processes over the high-carbon options; phase-out of current high-carbon assets

- Policy choices:
  - Phase out fossil fuel subsidies; carbon price to mediate economy-wide action
  - Standards and other regulations, subsidies, government investment as an alternate to fill any resulting gaps

3rd Domain

- Policy objectives:
  - Development & cost reduction of long-term decarbonisation technologies
  - Adaptation of infrastructure to low-carbon energy options

- Policy choices:
  - Investment in technology RDD&D
  - Public spending on high cost strategic infrastructure

Short-term policy cost
- Higher short-term cost, for long-term benefits
- Moderate cost
- Negative cost (saves money)
Comparing the role of carbon price and policies in IEA scenarios

Targeted policies can peak emissions, but high carbon prices and advanced technologies give deeper reductions consistent with climate goals.

Source: WEO2018 & Insights series 2017 - Real-world policy packages for sustainable energy transitions

Five policies that deliver cost-effective short-term emission reductions to peak global emissions

High carbon price plus early support for advanced technologies
The targeted policies of the Bridge Scenario do a good job of aligning new power sector investment with a 2C Scenario.
What’s missing? Coal retirement and CCS retrofit

High carbon prices in the 450 Scenario are needed to drive early retirement of coal plant and retrofit for carbon capture and storage.

Transport sector: Comprehensive policy packages needed

Carbon pricing itself cannot unlock more substantial technology shifts such as electrification or advanced biofuels development.
Domains of policy packages

Real-world policy packages
- Negative cost opportunities
- Optimisation based on pricing
- Short-term investment for long-term returns

Multiple objectives
- Economic development
- Social and health benefits
- Energy security

Constraints
- Economic competitiveness and distributional impacts
- Historical economic structure & existing assets
- Attractiveness to investment

Sustainable energy transition
Thank you
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