

Beyond the Price of Renewables

The System Costs of Europe's Green Energy Transition

A synthesis of four previous studies on European energy policy

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Conference presentation · 2026

What this lecture is

A synthesis—not a new empirical paper

This presentation brings together four strands of my previous research and reframes them around the hidden costs of Europe's green transition.

1 · European comparison

Germany, Denmark and the United Kingdom: renewable expansion, prices, taxes, subsidies and market structure.

2 · PPAs in Spain

How regulatory simplification can reduce barriers—and how public guarantees can create new intervention.

3 · Hidden fiscal costs in Spain

Taxes, levies, subsidies, market access restrictions and the transparency of the electricity bill.

4 · Grid resilience and interconnection

Spain as a European node: renewable abundance is less valuable without transmission, flexibility and cross-border capacity.

The purpose today is to connect these findings at the European level.

A clarification at the outset

The debate is about means, not the environmental goal

We are not against environmental protection.

We are critical of interventionist instruments when they distort prices, investment, entry, competition or cost transparency.

- Environmental quality can be a legitimate and important social objective.
- The policy question is how to pursue that objective efficiently and sustainably.
- Markets, entrepreneurship, property rights, competition and cross-border integration are also environmental institutions.

What do “hidden costs” mean in this lecture?

Costs that are not visible in the generation price alone

1 · Fiscal

Taxes, levies and subsidies can raise final prices or move costs away from the headline energy price.

2 · Regulatory

Price controls, licensing, access restrictions and administrative rules can weaken entry and competition.

3 · Financial

State guarantees and support schemes can socialise risks that private contracting and insurance may price differently.

4 · System

Renewable capacity also needs grids, interconnection, flexibility, storage and reliable market integration.

The green transition is therefore not only a question of how cheaply renewable electricity can be generated.

It is also a question of how the whole electricity system is financed, coordinated and connected.

Free-market environmentalism: the mechanism

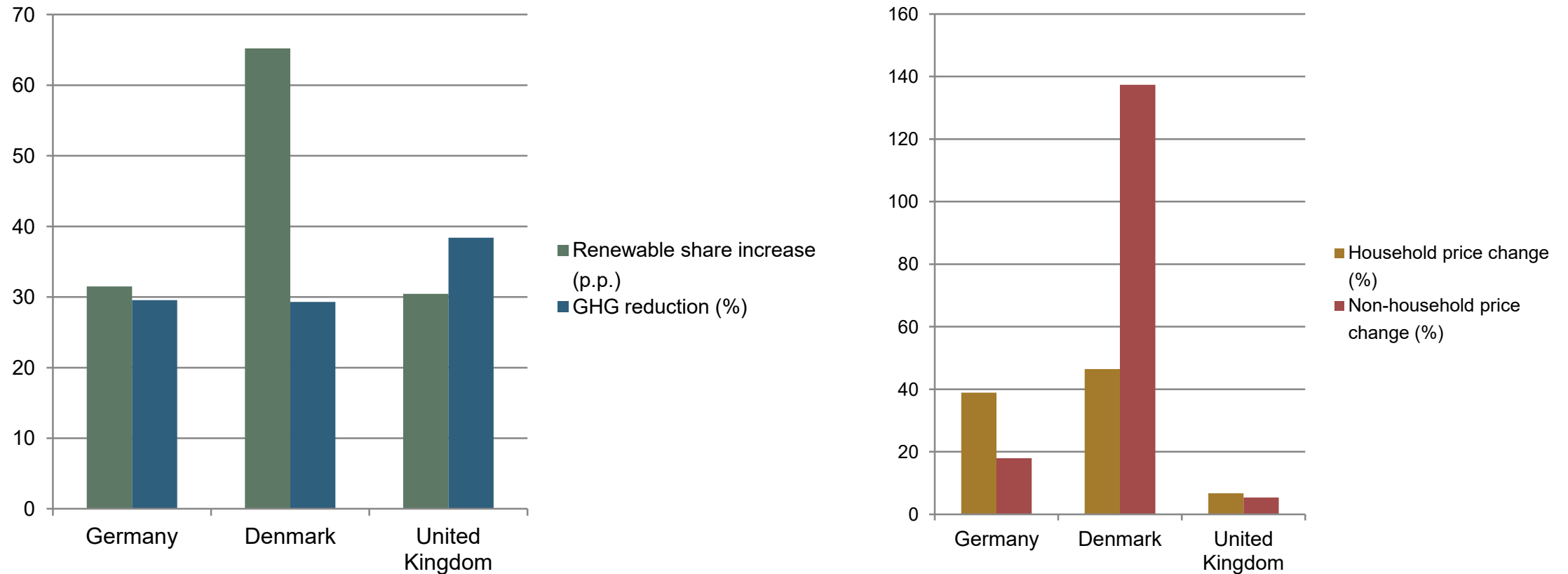
Why institutional design matters for the transition



- Centralised targets may pursue worthy ends, but policymakers still face a knowledge and calculation problem.
- Intervention can change prices and incentives before entrepreneurs and consumers reveal their preferences.
- The practical question is therefore which institutions let environmental improvement and economic coordination reinforce one another.

Europe's transition achieved real environmental progress

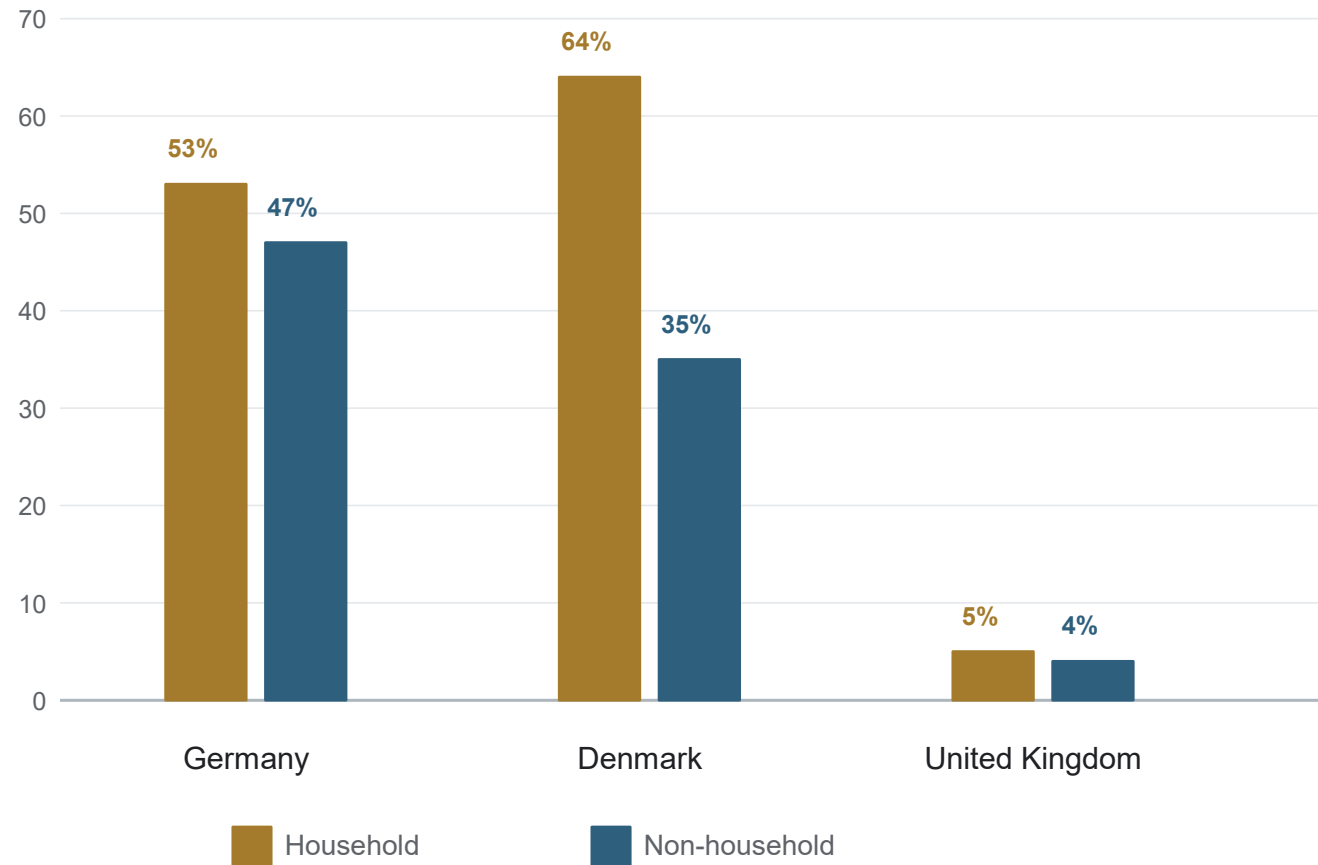
But affordability did not improve uniformly, 1990–2018



Key point: more renewable energy and lower emissions did not automatically translate into lower consumer prices.

Hidden cost #1: taxes and levies

A historical comparison from the 2021 study



Germany

Around half of the electricity price was attributed to taxes and levies in the paper's 2016 comparison.

Denmark

Household taxation was especially high, despite strong renewable performance.

United Kingdom

Much lower tax shares accompanied relatively contained real-price growth over the study period.

Spain: when the headline tax rate hides other charges

A historical example from the “hidden costs” policy paper

≈ 60%

of the historical industrial electricity bill was attributed in the paper to taxes, levies and related policy charges rather than the underlying electricity cost.

Historical framework—not a claim about today's bill.

- The paper highlights VAT, renewable-support charges, non-peninsular system costs and tariff-deficit components.
- The broader lesson is transparency: consumers may see a final electricity price without seeing which institution created each component.
- This is why “hidden costs” should refer to cost incidence and policy design—not only to the wholesale price of energy.

Policy implication: make every cost layer visible and contestable.

Hidden cost #2: regulation and barriers to entry

A cost can appear as fewer choices, not only as a higher tax

Price controls & administered prices

When prices are politically fixed, market signals about scarcity and investment can be weakened.

Industry access restrictions

Licensing, switching frictions and market concentration can protect incumbents and reduce entrepreneurial entry.

Subsidy competition

Firms can compete for political support rather than for consumers, shifting attention from market discovery to rent seeking.

- Germany and Denmark combined successful decentralised initiatives with interventionist policy layers.
- The UK was relatively more market-oriented in taxation, but still retained price caps, licensing and access restrictions.
- Spain's solar and electricity markets also illustrate how administrative rules can raise perceived policy risk for investors.

Hidden regulatory cost = the opportunities, investments and competitors that never enter the market.

A market-oriented alternative: Power Purchase Agreements

Spain shows how removing barriers can support renewable investment

Since 2019, Spain's PPA framework introduced several forms of regulatory simplification.

Simpler access

RD 244/2019 simplified administrative treatment for small-scale and on-site generation.

Lower charges

Some on-site PPA generation was exempted from specified charges and tolls.

Longer contracts

Public-procurement power-supply contracts were extended from four to ten years.

More self-consumption

Rules enabled shared self-consumption and compensation for some surplus generation.

Lesson: deregulation can itself be an environmental policy.

But market instruments can be re-intervened

The design of risk-sharing matters

FERGEI and public guarantees

- The framework required some electro-intensive consumers to contract a share of demand through renewable PPAs.
- A state reserve fund was designed to guarantee part of the credit risk.
- The paper questions whether public insurance may create new regulatory and pricing distortions.

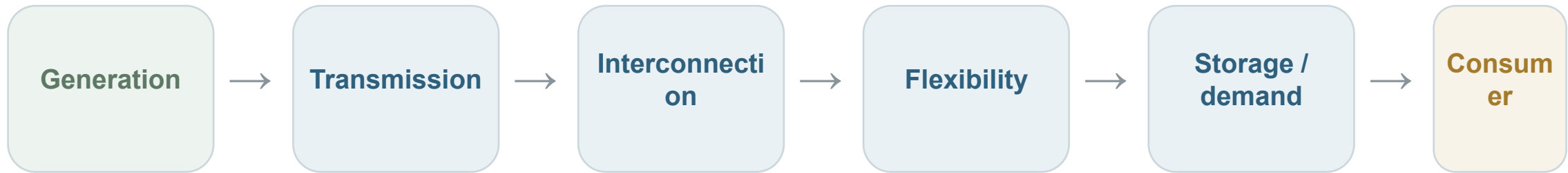
Market-based risk management

- Long-term contracts already allocate price and volume risk privately.
- Private insurance and financial hedging can price credit risk without making taxpayers the default backstop.
- The policy challenge is to remove barriers while avoiding new layers of politically allocated risk.

The hidden cost is not only the subsidy itself—it is also who ultimately bears the risk.

Hidden cost #3: the electricity system itself

Renewable generation has value only when it can be delivered reliably

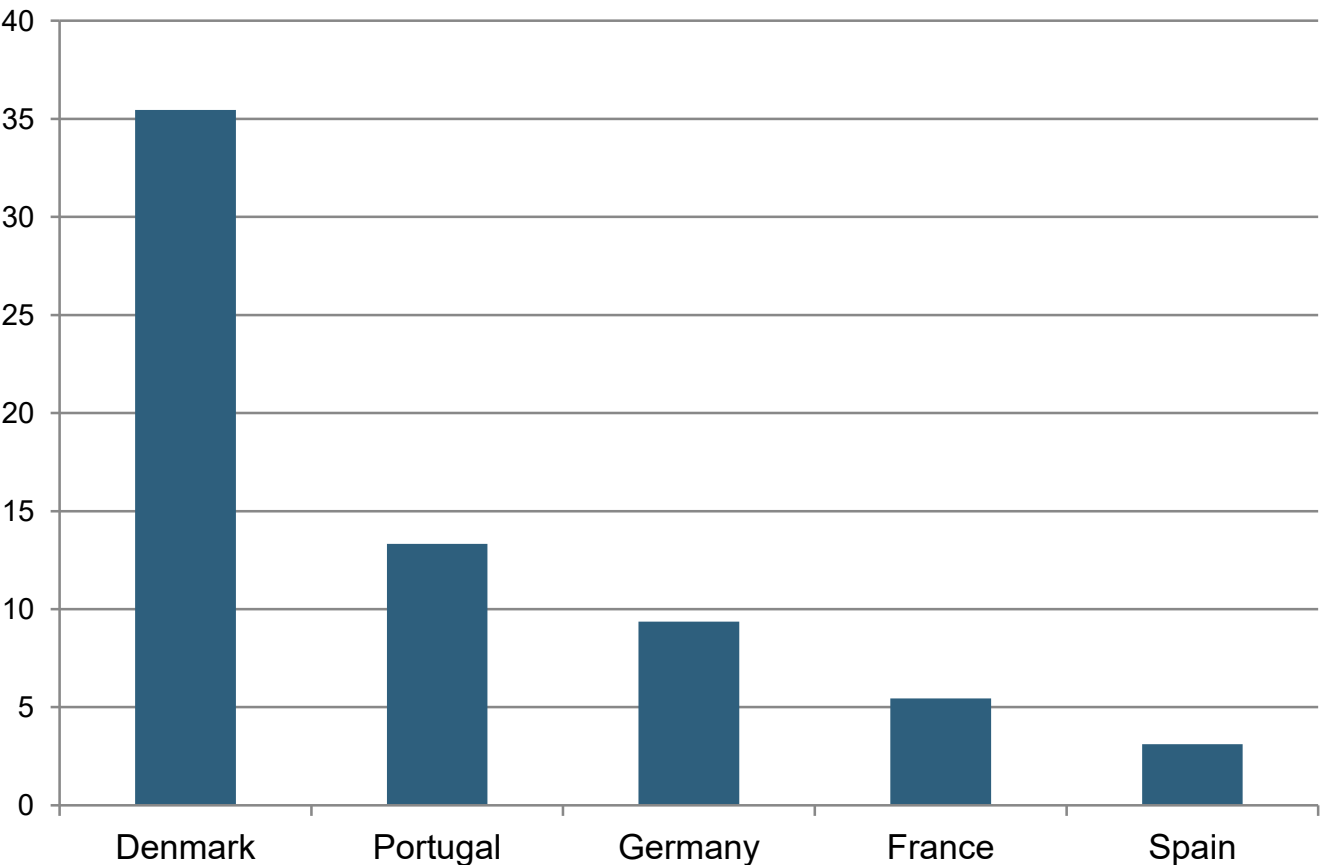


If one link is weak, the cost can reappear as congestion, curtailment, network investment, balancing needs or lost market value.

This extends the “hidden cost” argument beyond taxation: a low generation price is not the same thing as a low system cost.

Spain shows why system integration matters

Electricity interconnection levels, 2026



3.11%

Spain's interconnection level in 2026

15%

EU interconnection benchmark for 2030

Spain can generate renewable electricity, but its European value is constrained when cross-border capacity is scarce.

Renewable abundance still requires complementary investment

Spain, 2025–2026

55.5%

Renewables in Spanish
electricity generation, 2025

€1.424 bn

Transmission-network
investment in 2025

486 km

New transmission circuit added
in 2025

5,000 MW

Target France–Spain capacity after Bay of
Biscay project

The Spanish case illustrates a broader European principle:

Renewable capacity can grow faster than the grids and interconnectors needed to turn that capacity into a resilient, integrated market.

- The hidden system cost is not an argument against renewables; it is an argument for counting complementary infrastructure honestly.
- Cross-border integration can also lower costs by improving price convergence and making surplus generation tradable.

A European synthesis

Different countries, different bottlenecks—one common institutional lesson

Germany

Strong renewable expansion and decentralised initiatives

But high taxes/subsidies and administered support can distort prices.

Denmark

Very high renewable penetration and strong community participation

But household tax burdens were historically substantial.

United Kingdom

More market-oriented taxation and liberalisation in the study period

But price caps and market-access barriers remained.

Spain

Fast renewable growth, PPAs and large infrastructure investment

But fiscal layers, regulation and weak interconnection remain relevant.

Europe does not need one uniform interventionist model. It needs institutions that reveal costs, allow entry, reward innovation and connect markets.

A pro-environment, pro-market transition

Policy direction suggested by the four studies

1

Make costs transparent

Separate energy, network, tax, subsidy and policy-related components so consumers and investors can see who pays.

2

Reduce distortionary intervention

Lower unnecessary taxes, subsidies, price controls and entry restrictions that weaken market coordination.

3

Let contracting work

Use PPAs, competition, hedging and private risk management rather than default public guarantees.

4

Build integration where it adds value

Prioritise interconnection and grid investment where they improve resilience, price convergence and renewable integration.

5

Keep technology and entrepreneurship open

Do not pre-judge which technologies, firms or business models must win the transition.

What the four studies together suggest

Five takeaways

- Europe has made genuine progress in renewable deployment and emissions reduction.
- The price of renewable generation is only one part of the economic story.
- Taxes, subsidies, regulation, public guarantees and weak market access can shift or conceal transition costs.
- Grid, interconnection and flexibility costs are real system requirements and should be counted transparently—not used as an argument against environmental protection.
- A market-oriented transition seeks the same environmental objective through clearer prices, stronger competition, entrepreneurship and better integration.

The central question is not whether Europe should protect the environment—but whether it can do so without hiding the economic costs of intervention.

Four studies behind this presentation

Wang, W. H., Moreno-Casas, V., & Huerta de Soto, J. (2021). A Free-Market Environmentalist Transition toward Renewable Energy: The Cases of Germany, Denmark, and the United Kingdom. *Energies*, 14(15), 4659.

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Thank you