NordicTwinSeaZone

An EU Model Region for 2030: Converting Renewable Power into European Industrial Sovereignty.

IHK Schleswig-Holstein
Flensburg · Kiel · Lübeck

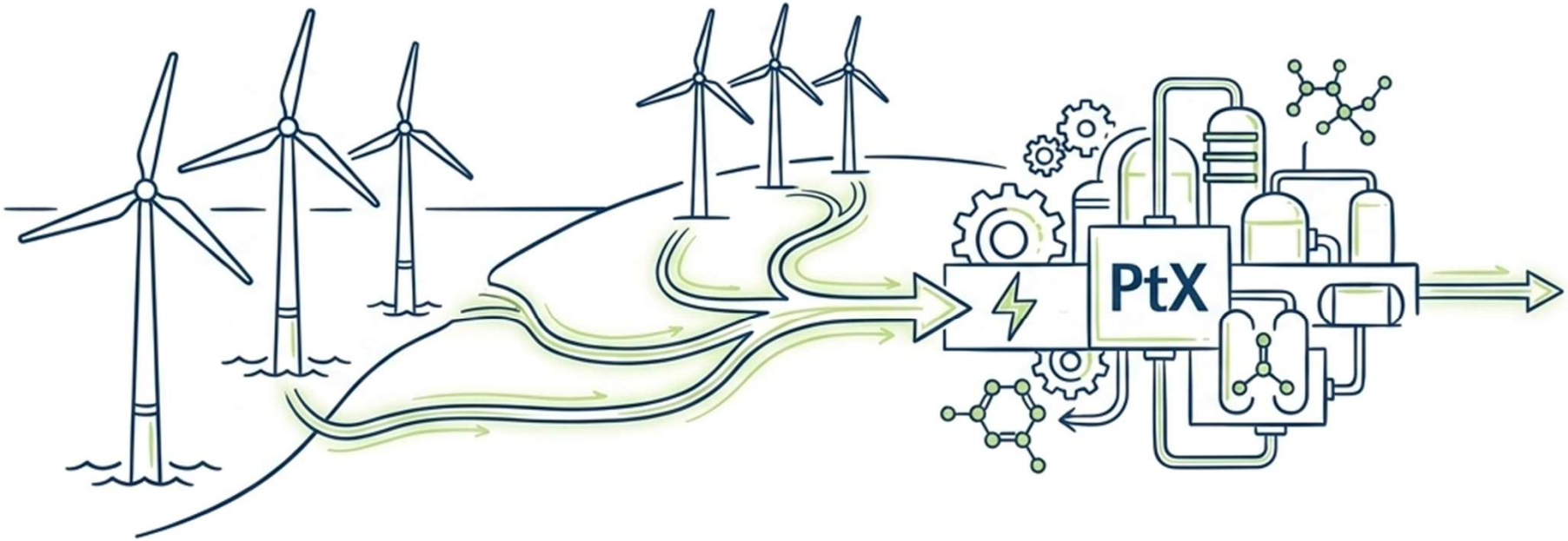


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The NordicTwinSeaZone (NTSZ)

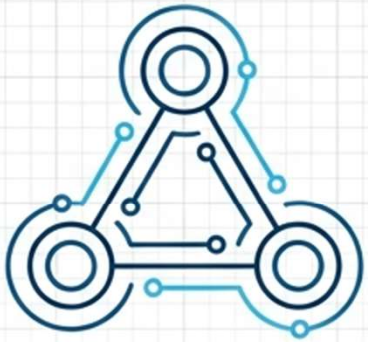
A Blueprint for European Energy Resilience, Value Creation, and Market-Driven Stability



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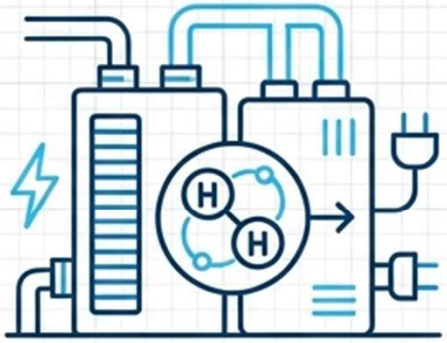
Management Summary

The NTSZ Opportunity



The Vision (The ‘What’)

Merging DK1 (Western Denmark), Schleswig-Holstein (SH), and Hamburg (HH) into a single, highly liquid electricity price zone.



The Engine (The ‘How’)

Integrating 3 GW of flexible electrolysis to treat renewable electricity as the starting point for integrated hydrogen, heating, and Power-to-X value chains.



The Outcome (The ‘Why’)

Eliminates extreme price volatility, slashes grid congestion, and secures European energy sovereignty by replacing fossil imports with domestically produced green molecules.

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The Policy Crossroads

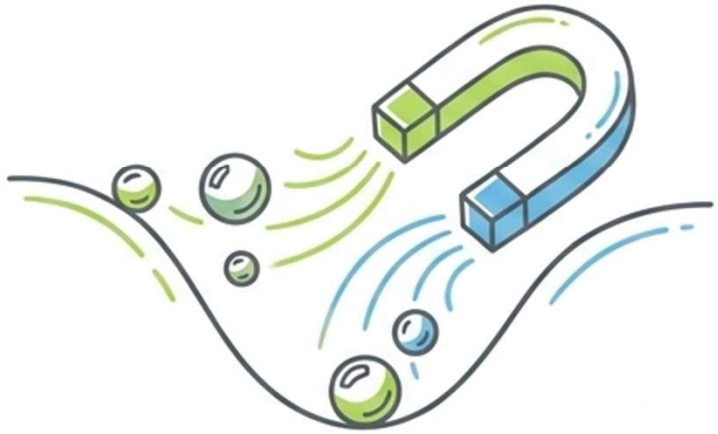
From Regulatory Push to Economic Pull

The Push Factor (Current Paradigm)



Relies on state subsidies, **complex regulatory mandates,** and **artificial redispatch interventions**. Results in high system costs, wasted renewable **generation,** and continuous political friction.

The Pull Factor (The NTSZ Vision)

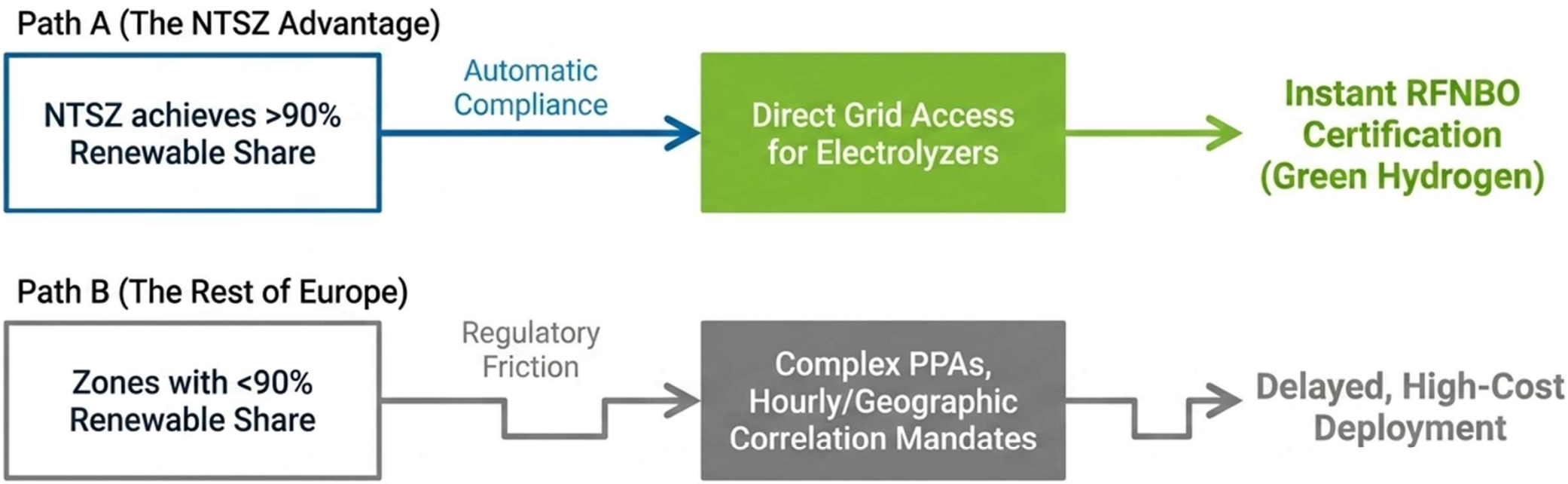


Redefining market zones allows **cheap, abundant renewable energy to naturally attract** flexible industrial demand. Creates self-sustaining, profitable business models without constant state aid.

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The 90% Catalyst

Unlocking the RED III Hydrogen Advantage



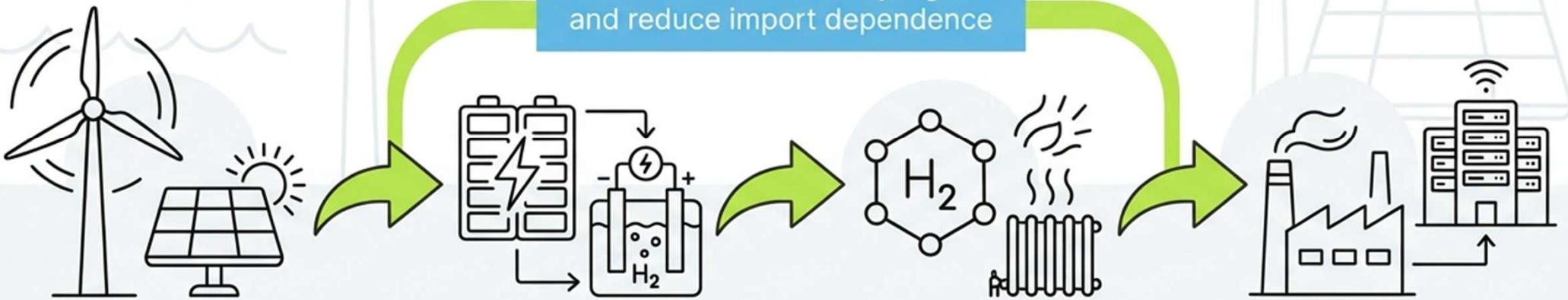
Because the NTSZ naturally exceeds the 90% threshold, it acts as a regulatory fast-lane. Electrolyzers can **tap directly into the wholesale market** without complex bilateral contracts, massively **accelerating** the hydrogen ramp-up.

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The Core Vision: Integrated Molecular Value Creation

Securing European independence by extending the energy value chain

The Goal: Avoid scarcity signals and reduce import dependence



Stage 1
Renewable Generation
Complementary Portfolios (Offshore, Onshore, Biomass)

Stage 2
Market-Based Flexibility
3 GW Electrolysis & Storage

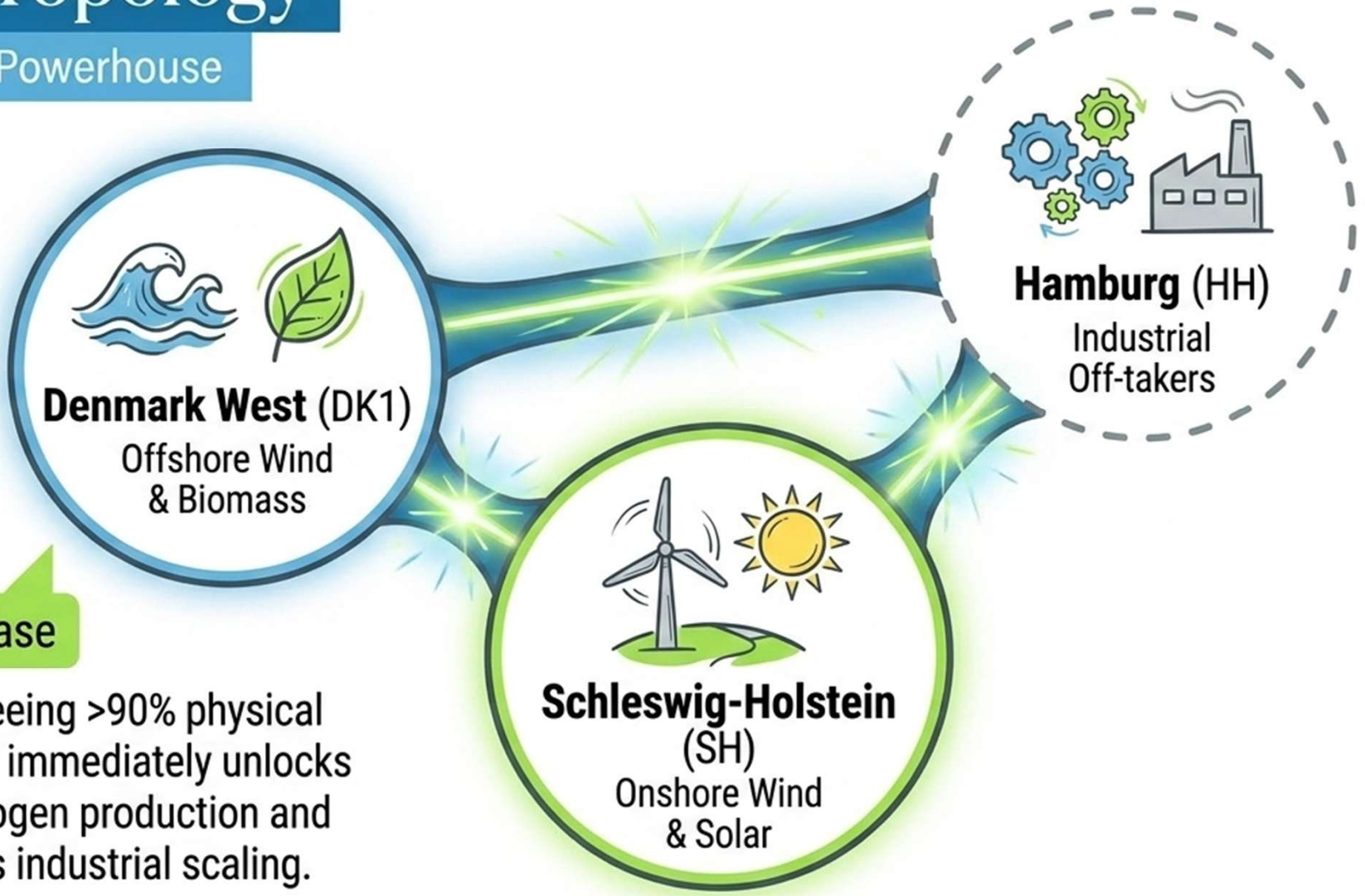
Stage 3
Green Molecules
Power-to-X, Hydrogen & District Heating

Stage 4
Industrial Resilience
Geopolitical Independence & Reliable Baseload

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The NTSZ Topology

A >90% Renewable Powerhouse



RED III Compliant Base

Permanently guaranteeing >90% physical renewable generation immediately unlocks simplified green hydrogen production and massively accelerates industrial scaling.

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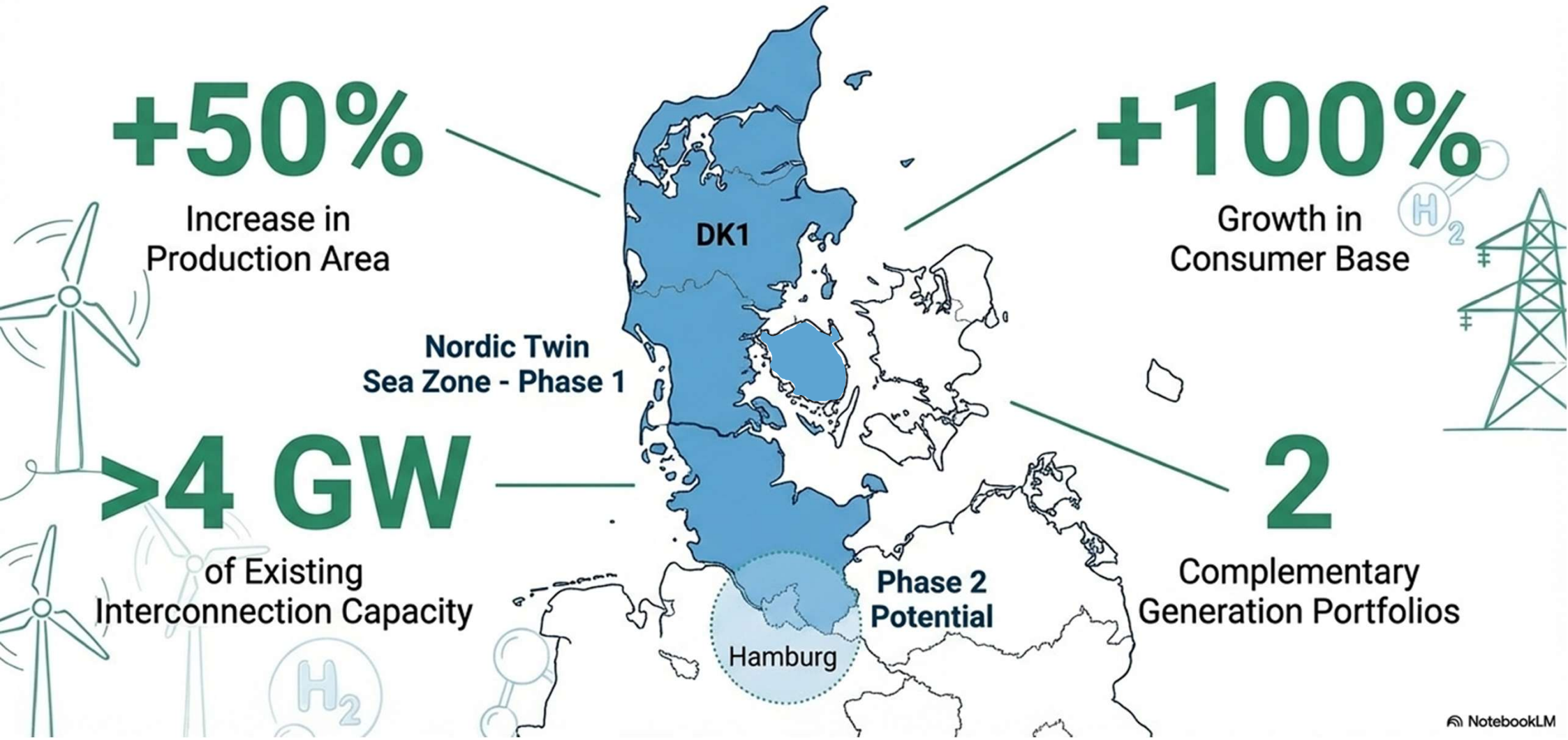
Defining the Nordic Twin Sea Zone

+50%

Increase in Production Area

+100%

Growth in Consumer Base



>4 GW

of Existing Interconnection Capacity

2

Complementary Generation Portfolios

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Beyond Electricity: Integrated Value Chains

Creating a circular energy ecosystem in Northern Europe.



Offshore Wind



Onshore Wind

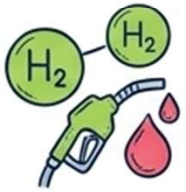


Solar



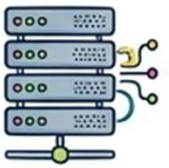
Biomass

NTSZ + 3GW



Industry & Mobility

Transformation into Green H_2 and e-fuels for heavy industry and transport.



Data Centers

Attracting hyper-scalers through stable baseload prices and guaranteed >90% green power.



District Heating

Capturing massive industrial waste heat from electrolyzers to aggressively decarbonize local heating networks.

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Systemic Assessment towards 2030 (SWOT)

Strengths

- Optimized market structure & liquidity.
- High RES portfolio diversity (Offshore, Onshore, Solar).
- Strong >4 GW existing interconnectors.
- Guaranteed RED III compliance.

Weaknesses

- One-time regulatory and legislative hurdle.
- Requirement to shift the grid boundary to the Elbe.
- Required adjustments to EEG premium mechanisms.

Opportunities

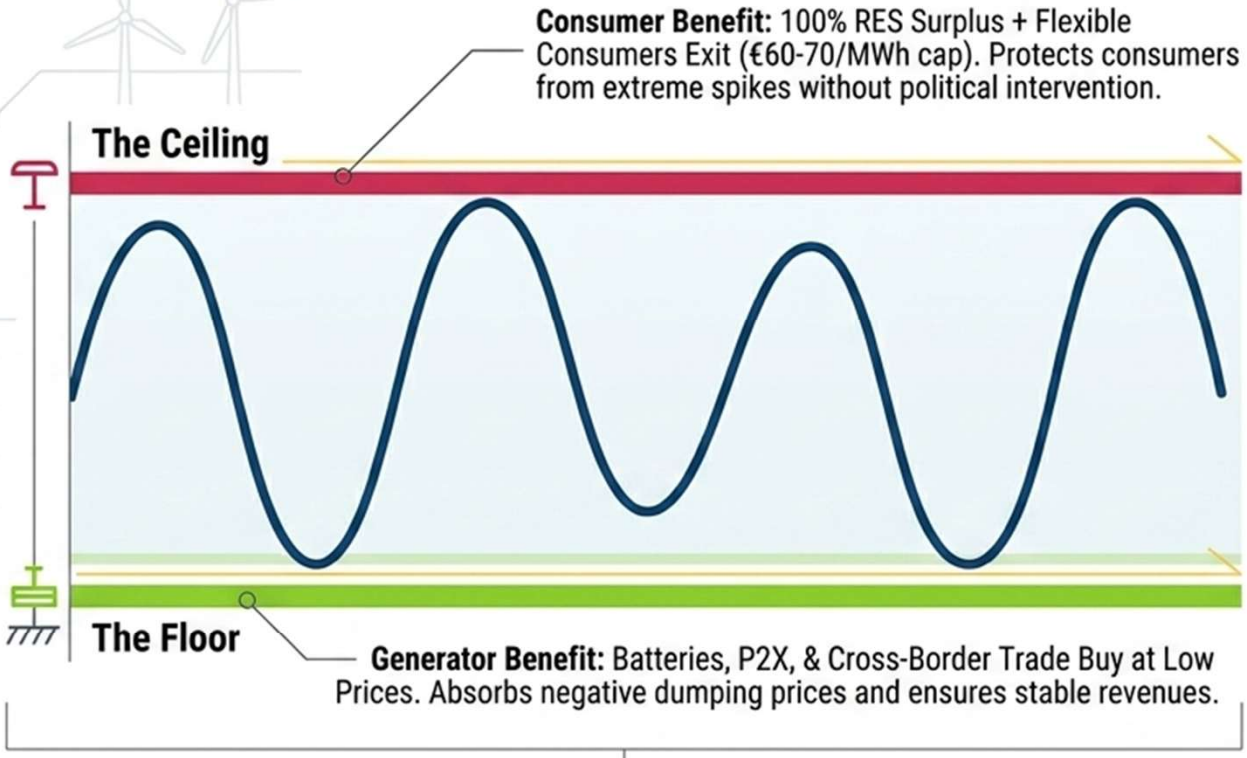
- Establishing a European Green Energy Hub.
- Future zone expansion to Hamburg.
- Scaling P2X baseload flexibility.
- Regional waste heat for district heating.

Threats

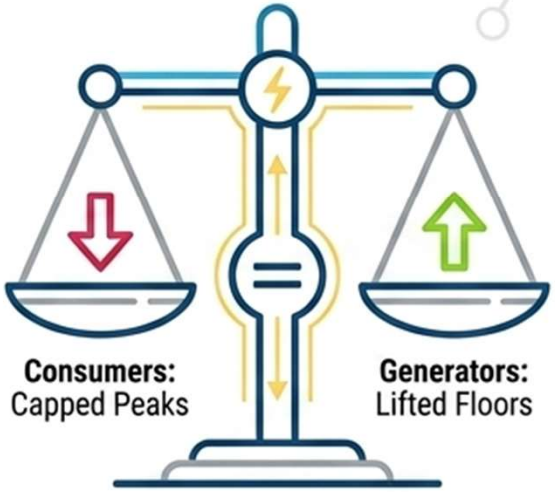
- Expected political resistance in Southern Germany.
- Potential EU administrative approval delays.
- Temporary market adjustment periods for local industry.

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Market Dynamics: Capping Peaks and Lifting Floors

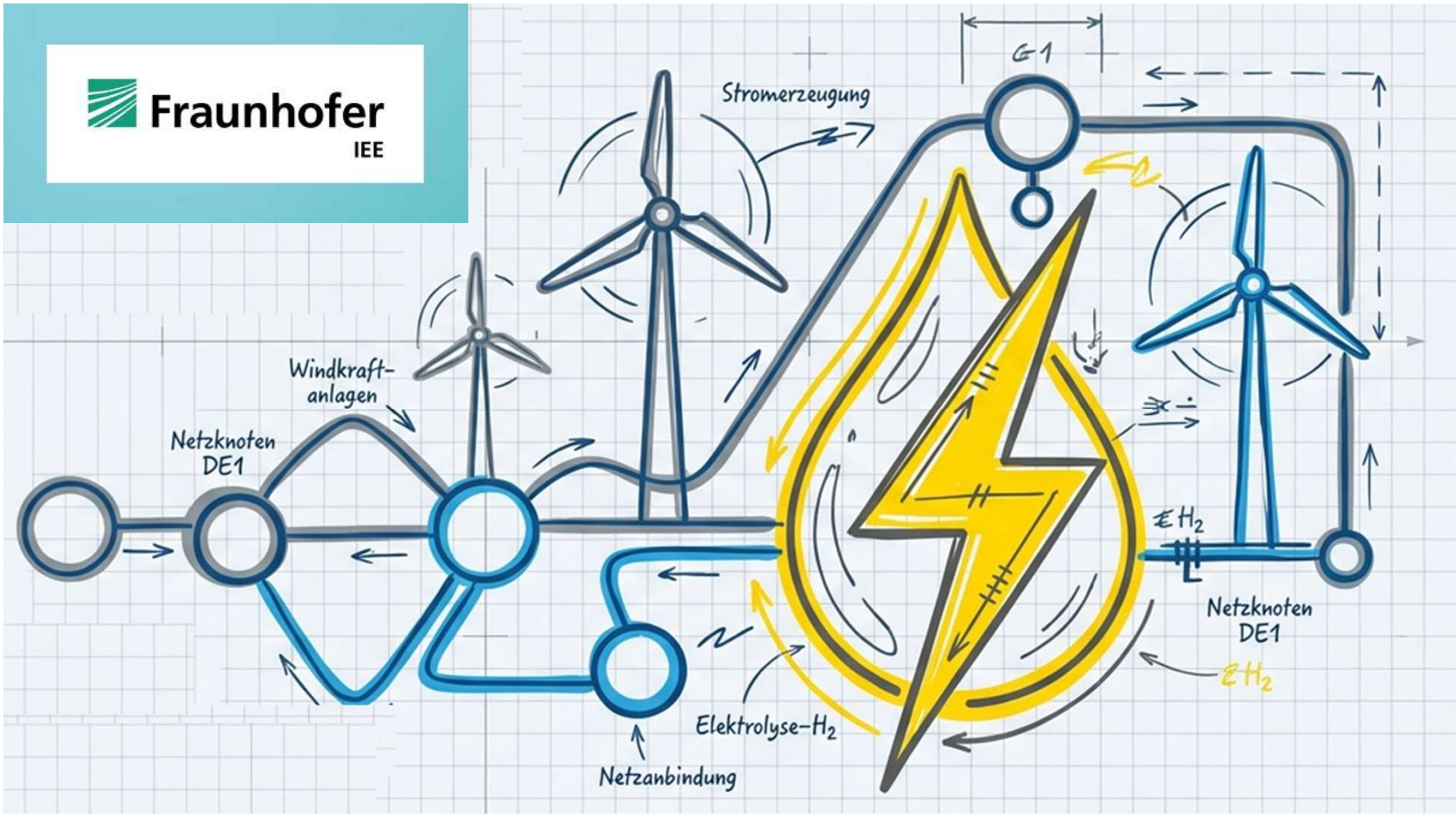


The Price Corridor Diagram



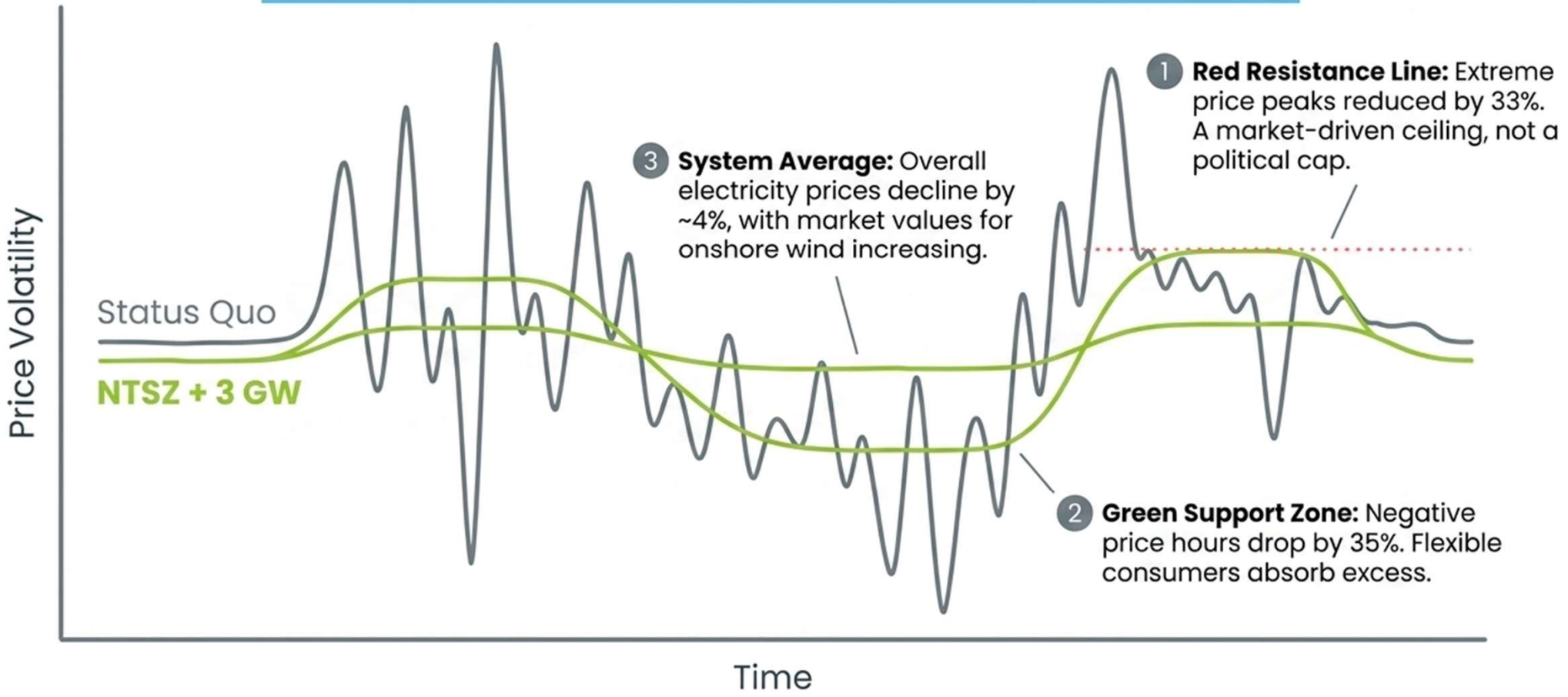
Double Benefit Balance Scale

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Fraunhofer
IEE
G1
Stromerzeugung
Windkraft-
anlagen
Netzknoten
DE1
Elektrolyse-H_2
Netzanbindung
H_2
Netzknoten
DE1
H_2

Systemic Proof: Taming Volatility

Fraunhofer IEE 2030 Scenario Analysis

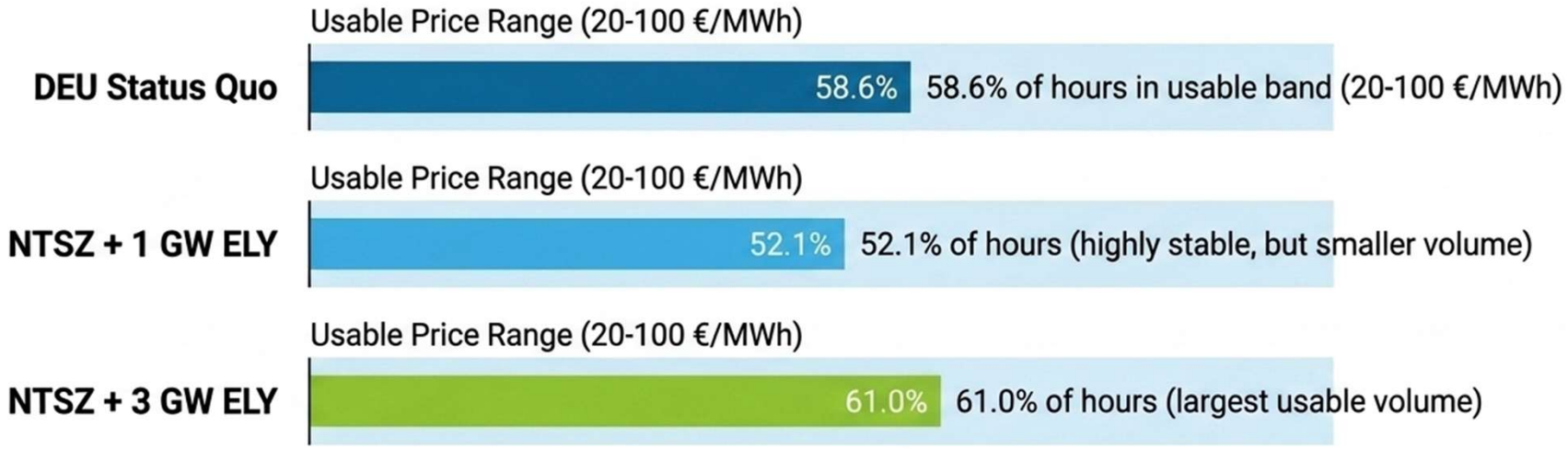


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Empirical Validation: Fraunhofer IEE 2030

The systemic benefits of the 3 GW Electrolysis Scenario

Creating the ultimate currency for industry and data centers: Price Predictability.



Interpretation: The 3 GW scenario expands the optimal industrial price window by >200 hours per year. By shifting hours away from extreme highs and extreme lows, the NTSZ delivers highly predictable, moderate baseload costs.

Conclusion: 3 GW of flexible electrolysis is the clear systemic and economic optimum.

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Empirical Validation: Fraunhofer IEE 2030

The systemic benefits of the 3 GW Electrolysis Scenario

−75%



Market-based curtailment in Schleswig-Holstein drops from 1.2 TWh to just 0.3 TWh.

−5 TWh



Reduction of Grid Bottlenecks in Germany

−35%



Reduction in negative price hours. Average consumer electricity costs fall by ~4%.

Price Stability −33%



extreme price spikes are limited by market forces

Conclusion: 3 GW of flexible electrolysis is the clear systemic and economic optimum.

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The Value Multiplier

RED III & Hydrogen Economics

Step 1: The 90% Threshold



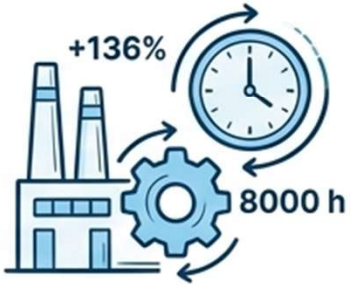
The NTSZ structurally guarantees a >90% renewable energy share in the grid well before 2030 (RED III compliance).

Step 2: Regulatory Barriers Fall



Additionality requirements, temporal correlations, and spatial correlations for green hydrogen production are eliminated.

Step 3: Baseload Utilization



Electrolyzers transition to baseload infrastructure. Capacity utilization jumps by +136%, unlocking >5,000 to 8,000 full-load hours per year.

Step 4: The Competitive Output

€3-5 / kg

(€90-150/MWh) averaged over a 20-year contract



This high utilization enables domestic green hydrogen production at globally competitive prices without non-EU fossil imports.

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Shared Strengths: Benefits for Denmark (DK1)



Improved Market Liquidity

A larger pool of traders reduces transaction costs and stabilizes demand curves during holidays or daily fluctuations.



Clean Imports

Supply new major consumers in Jutland with highly reliable green power from Schleswig-Holstein, instead of importing electricity of unknown fossil origin.



European Green Hub

Solidifies DK1's position as a premier European destination for large-scale Power-to-X, hydrogen production, and major corporate investments.

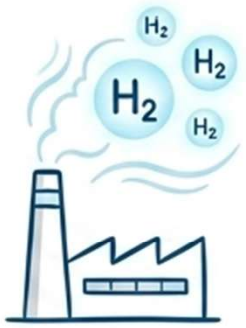
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Shared Strengths: Benefits for Germany (SH/HH)



Massive Grid Relief

Resolving the transmission bottleneck at the Elbe river structurally. Saves approximately 1 TWh of curtailed power and reduces nationwide redispatch costs.



Industrial Revival

Transforms Schleswig-Holstein into a high-value producer of domestic, competitively priced green hydrogen for German industry.



Decarbonizing Hamburg

Future integration of Hamburg provides simplified access to a massive pool of green power, directly accelerating the city's ambitious climate neutrality goals.

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Perfect Alignment

Meeting ACER & EU Bidding Zone Review Goals

ACER BZR Requirements	NTSZ Deliverables
Market Structure & Liquidity	✓ Creates a larger unified zone (DK1+SH), unlocking higher participant liquidity and stabilized forward curves.
Renewables & Flexibility	✓ Enables cost-efficient integration of massive PtX and battery storage via a legally compliant >90% RES generation base.
Network Security & Trade	✓ Capitalizes on >4 GW of existing interconnectors, driving cross-border trade and structurally reducing bottlenecks.
Price Stability & Welfare	✓ Delivers market-driven dampening of peak extremes, yielding significant overall social welfare gains.

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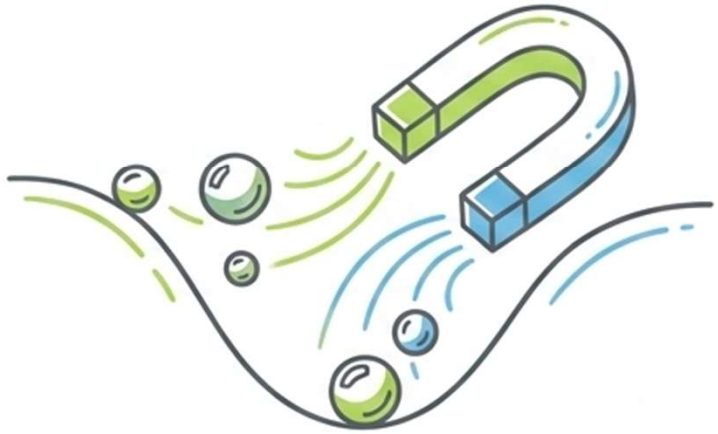
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The Economic Pull Loop

How Flexible Demand Optimizes the Grid



Abundant Renewables

High wind/solar generation naturally lowers local wholesale prices in the NTSZ.

Attracting Flexibility

Low prices act as an economic magnet, pulling in 3 GW of flexible electrolyzer capacity.

Grid Stabilization

Electrolyzers absorb the excess spikes, flattening extreme price volatility.

Value Rescue

Curtailment drops by 75%. Because wind and solar are actually used rather than curtailed, their structural market value increases.

A self-healing market design. We do not need to subsidize the solution; we simply need to allow the market zone to reflect physical reality.

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A Market-Driven Future

Implementing the Nordic Blueprint

The Reality: We cannot achieve energy sovereignty through continuous regulatory friction and subsidized redispatch.

The Solution: The NordicTwinSeaZone relies on physics and economics. It aligns market borders with physical grid realities.

The Outcome: It pulls investment, stabilizes prices, rescues renewable value, and unlocks competitive green hydrogen for Europe.

A robust, data-driven foundation for a resilient Europe.

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NTSZ: The Blueprint for Europe

Ready for dialogue and implementation.

Jan Peter Grigat
Referent Energiewirtschaft, CO_2 und Offshore-Energie

Björn Meyer
Geschäftsbereichsleiter Energie, Umwelt und Industrie

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