Breaking Through Green Premiums

A Policy Framework for Market Transformation

Addressing 20–100%+ cost differentials in low-carbon industrial products

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The Argument for Integrated Policy Mix

Evidence from Markets: Why Single Instruments Fail

- Carbon pricing alone insufficient (€80/tonne still generates losses for H_2-steel without support)
- Supply-side funding without demand = project cancellations (ArcelorMittal €1.3bn)
- Voluntary commitments underwhelm (2–4% adoption vs. 25% needed)

Therefore: Three Simultaneous Interventions Required

- **Demand creation** → Guaranteed offtake through procurement/mandates
- **Cost reduction** → Direct subsidies, infrastructure, R&D support
- **Market enablement** → Certification, disclosure, price discovery

Critical Conditions:

- **Policy sequencing matters**
- **Coordination across value chain essential**
- **Must persist 10–15 years for technology maturation**

Case Studies — What Worked

SWEDEN HYBRIT Most Successful

Integrated Approach

Strategy: State R&D funding + infrastructure (hydrogen storage −40% costs) + credit guarantees (80% of €1.2bn) + offtake agreements (Volvo, Mercedes) + renewable energy access

Results: 5,000 tonnes pilot production, 99.7% emissions reduction, €10bn+ investments mobilised

Key success factor: State coordination across entire value chain

CALIFORNIA BUY CLEAN

Procurement Standards

Strategy: Mandatory embodied carbon limits (1.95 kg CO_2e/kg for structural steel) + $10bn procurement leverage

Results: $4bn materials procured, 45–50% of state construction materials covered

Limitations: Set at average rather than best-practice levels; administrative burdens

US INFLATION REDUCTION ACT

Production Incentives

Strategy: $3/kg hydrogen credit (reduces premium $115/tonne) + $6.3bn industrial demos

Results: Improved project economics but SSAB withdrew, Cleveland Cliffs paused

Gap: Insufficient demand-side policies

Case Improvements — Missing Elements Analysis

HYBRIT → Could Be Even Stronger

MISSING: (1) Mandatory green steel content requirements in Swedish construction codes (2) Carbon Contract for Difference to guarantee long-term price floors

IMPACT: Would accelerate beyond early adopter phase, enable second-wave investments at faster pace

California Buy Clean → Needs Enhancement

MISSING: (1) Threshold reduction pathway (currently static at average) (2) Integration with federal CBAM-equivalent trade measures (3) Financial support for small producers meeting standards

IMPACT: Would drive continuous improvement vs. one-time compliance; prevent leakage; democratise access

US IRA → Requires Demand-Side Addition

MISSING: (1) Federal procurement mandates (not just voluntary Buy Clean) (2) Offtake agreement facilitation mechanism (3) Certification/price transparency infrastructure

IMPACT: Sweden mobilised €10bn with integrated approach; US could match with demand-side additions, avoiding "hydrogen available but no guaranteed buyers" problem

Japan GIF → Market Development Gap

MISSING: (1) Green public procurement requirements beyond automotive subsidies (2) Premium pooling mechanism to socialise costs

IMPACT: Would create stable domestic market, not just R&D advancement

Recommended Policy Architecture

Tier 1: Demand Certainty (Non-negotiable Foundation):

- **Mandatory green procurement standards (14–20% GDP leverage)**
- **Declining carbon intensity thresholds (e.g., −10% every 3 years)**
- **Carbon Contracts for Difference (15-year terms)**
- **Facilitated offtake agreement matching platforms**

Tier 2: Cost Mitigation (Scale Enablers):

- **Capital subsidies 30–45% for first-of-kind plants**
- **Shared infrastructure (hydrogen, renewables) investment**
- **Production tax credits targeting specific cost gaps**
- **Credit guarantees for technology risk**

Tier 3: Market Infrastructure (Transparency & Discovery):

- **Harmonised certification with stringent thresholds**
- **Mandatory Scope 3 disclosure**
- **Price transparency platforms**
- **Premium pooling mechanisms for SMEs**

Implementation Principles

Sequencing:

- R&D → Demonstration (supply-heavy) → Commercialisation (demand-heavy) → Maturity (carbon price + standards)

Coordination:

- Multi-level governance + international alignment (CBAM-style border measures)

Equity:

- Worker transition support + SME access programs

Adaptivity:

- Review cycles every 3–5 years with adjustment triggers

Expected outcome:

- **81% emissions reduction achievable in public procurement alone**
- **technology cost curves bend downward 2–3× faster than supply-only approaches**