Clean energy for EU islands

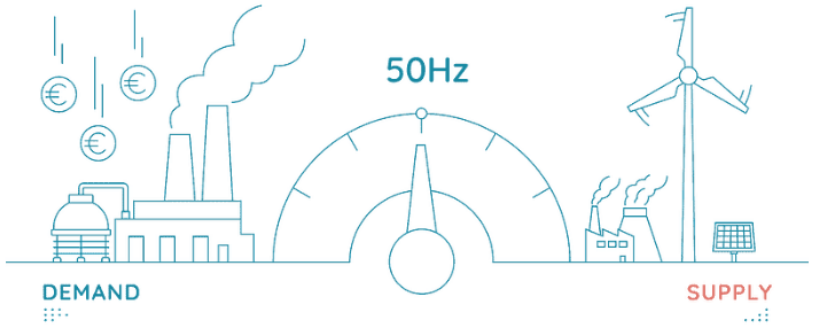
EU legislative framework on flexibility and demand side management

Brussels, 29/01/2025

#CE4EUislands

Why: A Paradigm shift in the Grid Balance

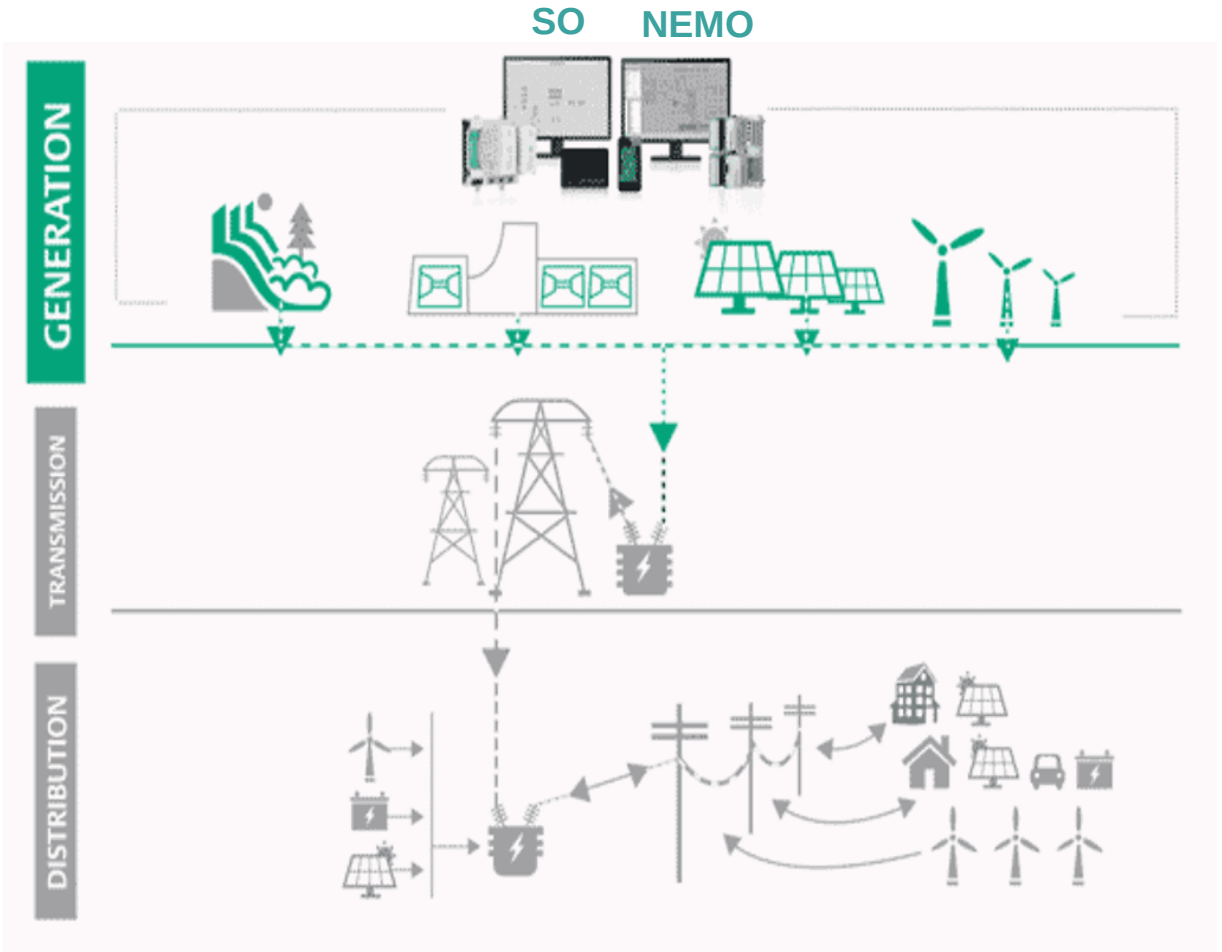
New Unknowns Parameters =
Higher Flexibility Needs temporal and spatial



Negative DEMAND: Non-synchronous uncertain

Negative SUPPLY: Controllable yet uncertain

Power Electronics and Storage: Unicorns!



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SmartEn + Energy Savings: What

Combined effort on promoting energy efficiency and demand-side flexibility

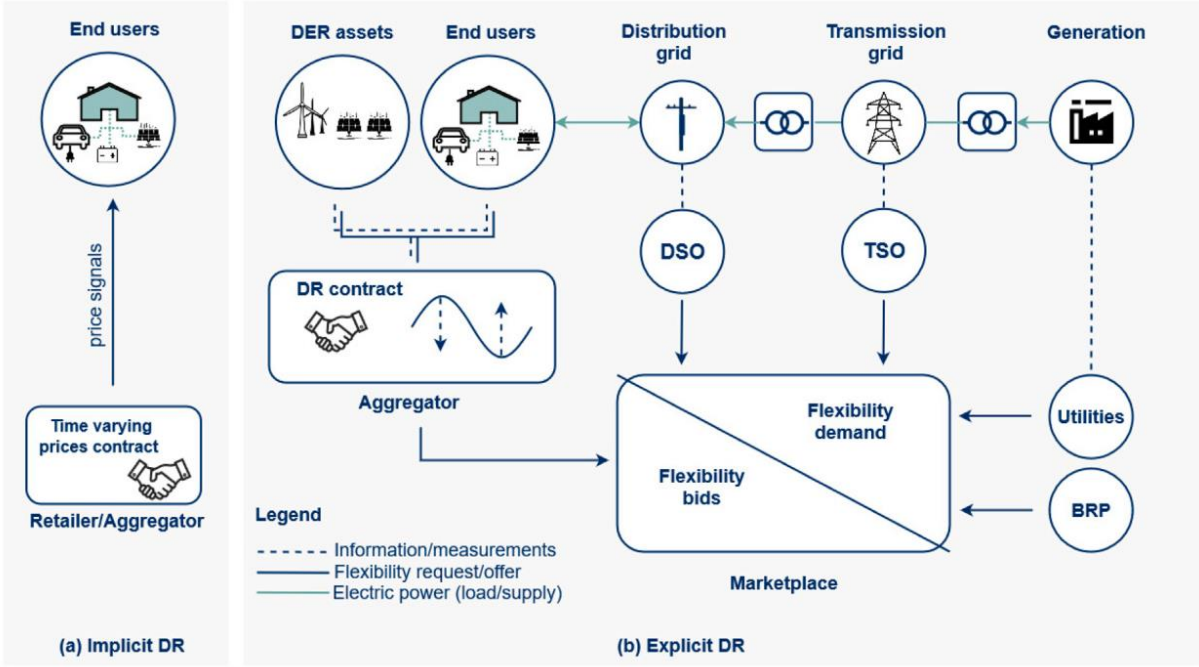
Empower all energy customers to:

- Reduce energy needs **efficiently**
- Adjust energy use **flexibly**
- Manage renewable generation and storage **affordably**

Economic Benefits of DSF per Projected annual savings*:

- €11.1B-€29.1B in distribution grid investments
- €2.7B in avoided peak generation capacity
- 15.5 TWh in avoided renewable curtailment
- 37.5M tonnes reduction in greenhouse gas emissions
- €71B in direct consumer savings

* Florence School of Regulation



The Coalition for ENERGY SAVINGS

smartEn SMART ENERGY EUROPE

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Main EU Acts Regulating DSF: How

ELECTRICITY REGULATION (2019/943)

Key Articles	Connection to DSF
Art 6: Balancing markets	Enables market participation of DSF resources
Art 7-7b: Day-ahead/intraday markets & peak shaving	Sets rules for trading flexibility in wholesale markets
Art 19e-f: Flexibility needs assessment	Requires assessment of system flexibility needs
Art 50, 57: Data sharing	Mandates sharing of system data for DSF services
Art 18: Network charges	Ensures cost-reflective pricing for flexibility

ELECTRICITY DIRECTIVE (2019/944)

Key Articles	Connection to DSF
Art 13, 17: Aggregation framework	Enables independent aggregation of DSF
Art 15: Active customers	Gives consumers right to provide flexibility
Art 15a: Energy sharing	Allows collective self-consumption and sharing
Art 23-24: Data management	Sets rules for DSF data access and sharing
Art 31-34: DSO roles	Requires DSOs to procure flexibility services

- **SmartEn (Dec, 2024): 70 EU provisions from 6 various EU legislative acts**

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Main EU Acts Regulating DSF

RENEWABLE ENERGY DIRECTIVE (2018/2001)

Key Articles	Connection to DSF
Art 15, 15a, 15b: RES integration	Promotes flexible RES integration
Art 18: Training requirements	Ensures qualified DSF installers
Art 20a: System integration	Enables smart charging and system integration
Art 22, 22a: Energy communities	Supports local energy initiatives

ENERGY EFFICIENCY DIRECTIVE (2023/1791)

Key Articles	Connection to DSF
Art 3: Energy Efficiency First	Prioritizes demand-side solutions
Art 11: Energy management	Promotes flexible energy management
Art 27: Network efficiency	Requires efficient grid operation
Art 29: Energy services	Supports DSF service provision

- **Definition of DSF - no strict legal definition but rather a concept.**

Main EU Acts Regulating DSF

NERGY PERFORMANCE OF BUILDINGS (2024/1275)

Key Articles	Connection to DSF
Art 11: Zero-emission buildings	Requires building flexibility capability
Art 13: Technical systems	Enables smart building systems
Art 14: EV infrastructure	Mandates EV charging readiness
Art 15: Smart readiness	Promotes building automation
Art 16: Data exchange	Enables building data sharing

ALTERNATIVE FUELS INFRASTRUCTURE (2023/1804)

Key Articles	Connection to DSF
Art 5: Charging infrastructure	Requires smart charging capability
Art 14: National frameworks	Sets planning requirements
Art 15: National reporting	Monitors implementation
Art 20: Data provisions	Enables charging data access

Many provisions were to be implemented by 2023, with additional provisions becoming applicable in 2024 and 2025!

This is not yet happening at pace!

- **Some main obligations due before 2023 inter alia include:**
  - **Ensuring that all decentralized energy resources (DERs), including small and aggregated assets, have non-discriminatory access to energy markets (ER Art. 6, 7, 8, 13 and ED Art. 11, 13, 15, 16, 17)**
  - **Providing consumers access to dynamic electricity price contracts to benefit from real-time price signals and equip consumers with smart metering systems that provide accurate and actionable energy data. (ED Art. 11, 13, 15, 19, 20 and EED Art. 22)**
  - **Establishing systems for managing and sharing energy data to facilitate market transparency and interoperability. (ED Art. 23)**
  - **Ensuring DSOs and TSOs collaborate effectively to integrate DERs into grid operations and enhance flexibility procurement. (ER Art. 57)**
  - **Implementing efficiency and flexibility standards - prioritise energy efficiency in system planning and decision-making. (EED Art. 3)**
  - **Setting Renewable Energy Communities: (RED Art. 22)**

DR resources are missing out on new opportunities!

- **Some main obligations due for 2024 inter alia include:**
  - **Introducing peak shaving products (ER Art. 7a) and supporting non-fossil flexibility schemes (ER Arts. 19g, 19h)**
  - **Introducing capacity mechanisms (ER Art. 21 and 22)**
  - **Technical building systems: (EPBD Art 13 §9)**
  - **Ensuring recharging (points) infrastructure : (AFIR Art. 5).**
  - **Enabling interoperable data exchange (AFIR Art. 20)**

What comes next?

- **Some main obligations due for 2025 inter alia include:**
  - **Conducting flexibility needs assessments (ER Art. 19e)**
  - **Setting indicative national targets for non-fossil flexibility contributions (ER Art. 19f)**
  - **Ensuring electric vehicles are fully integrated into electricity networks (ED Art. 33)**
  - **Facilitating the seamless integration of renewable electricity into the energy system (RED II Art. 20a)**
  - **Introducing the smart readiness indicator to assess and enhance buildings' capability to support energy flexibility (EPBD Art. 15)**

LIMITED TRANSFORMATION OF VEHICLES, BUILDINGS, INDUSTRIES INTO FLEX ASSETS

Art 5, 14, 15 AFIR
Art 3, 10, 11, 12, 13, 14, 15, 18, 19, 25, 26, Annex II, IV, V, VIII EPBD
Art 6a, 33 ED
Art 11, 22, 29 EED
Art 15a, 18, 20a, 22a, Annex IV RED

RESTRICTED PARTICIPATION OF ALL DERS TO ALL MARKETS AND MECHANISMS

Art 6, 7, 8 , 12, 13, 19g, 19h, 21, 22 ER
Art 20a RED

LIMITED MARKET-BASED PROCUREMENT FROM ALL DERS BY SOS

Art 31, 32, 36, 40, 54 ED
Art 7a, 57 ER

LIMITED ACCESS TO PRICE SIGNALS

Art 27, Annex XIII EED
Art 4, 11, 19 ED
Art 18 ER

LACK OF FRAMEWORKS TO INNOVATIVE SERVICES AND LOCAL INITIATIVES

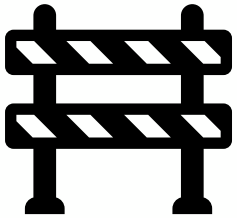
Art 13, 15, 15a, 16, 17 EED
Art 22 RED

LIMITED ACCESS AND EXCHANGE OF ESSENTIAL ENERGY DATA

Art 20 AFIR
Art 20, 23, 24, 34 ED
Art 16 EPBD
Art 7b, 50, 57 ER
Art 20a RED

NO VALORISATION OF DSF IN PLANNING & SYSTEM-WIDE ASSESSMENT

Art 3, 27 EED
Art 32, 51 ED
Art 18, 19e, 19f, 20 ER
Art 15, 15b RED



[7 main barriers addressed in the existing 70 EU provisions: A Study by SmartEn]

ENTSO E + DSO ENTITY: Network Code on Demand Response

From Prosumer to Flexumer

- Help integrate technology-neutral demand-side flexibility
- Set principles for the development of harmonised rules across the EU
- Define market-based processes for selecting the most cost-efficient resources

National Enforcement

All solutions will need to be assessed to connect more customers within national rules.

ACER to submit it to the European Commission by March 2025

National enforcement is expected to be in March 2027

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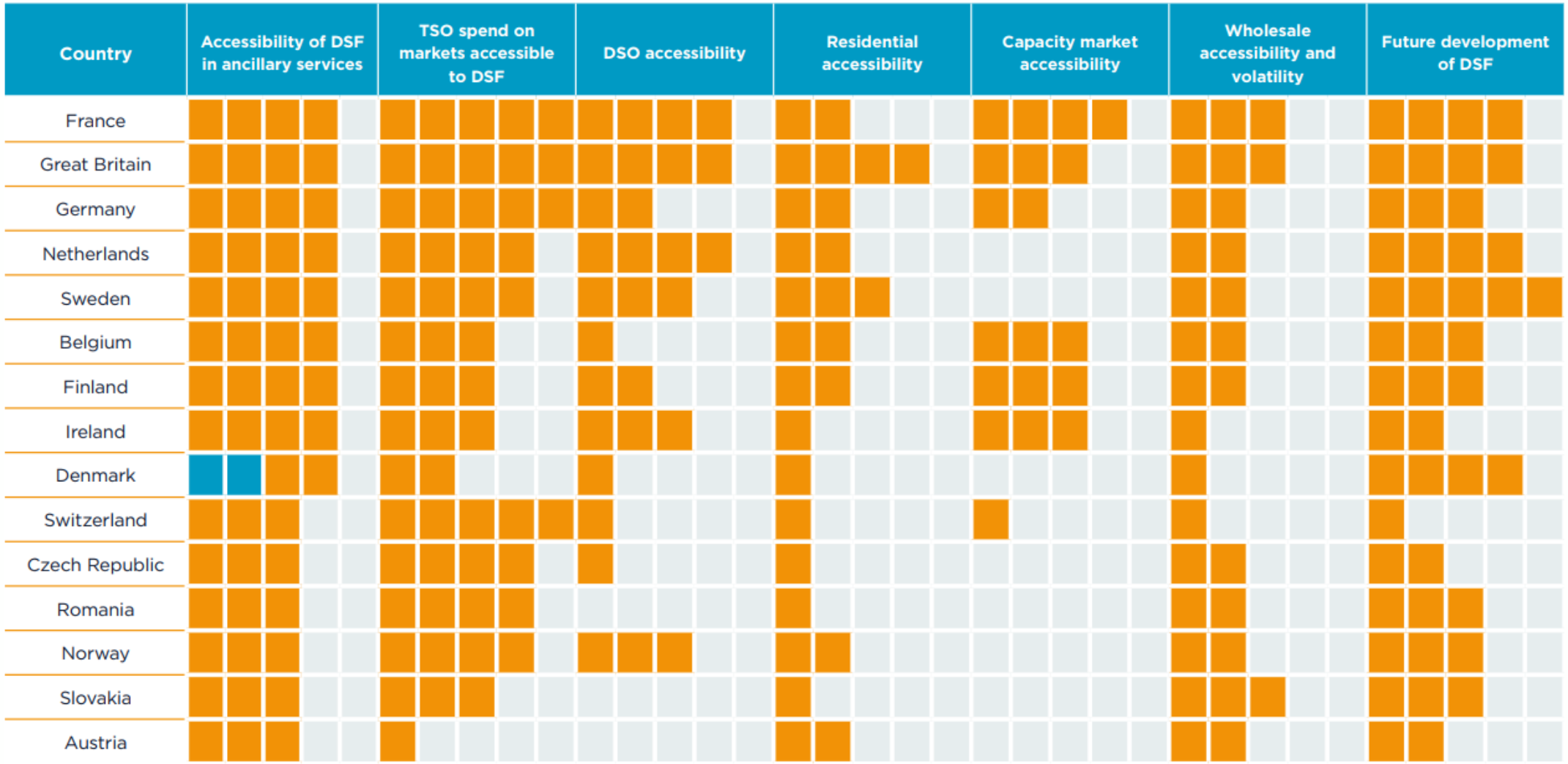
2023 EU Market Monitor For DSF



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Feature	United Kingdom	Belgium
Market Status	Fully open to DSF	Open to DSF
Markets Open to DSF	- Primary response - Secondary response - High-frequency response - Enhanced frequency response - Fast reserve - STOR (RR) - Demand Turn Up (RR) - Supplemental Balancing Reserve	- Primary reserves (FCR) - Tertiary reserves - Interruptible contracts - Strategic reserve - Wholesale electricity markets
Minimum Bid Size	- 1 MW for FRR - 3 MW for STOR - 2 MW for capacity market	1 MW for balancing services
Aggregation Framework	Established with Virtual Lead Parties (VLPs)	Transfer of Energy (ToE) framework: independent FSP
DSF Volume/Capacity	~4.5 GW total (2 GW markets, 2.5 GW network charges)	Not specified
DSO Flexibility Procurement	Yes - through platforms like: - Piclo Flex - Flexible Power	No established mechanism
Smart Meter Status	Rollout ongoing (expected completion 2024)	Planning stage
Network Tariff Incentives	- Triad Avoidance - Distribution Use of System Charge - Time of Use Tariffs	Limited incentives
Independent Aggregator Status	Fully enabled	Enabled with conditions

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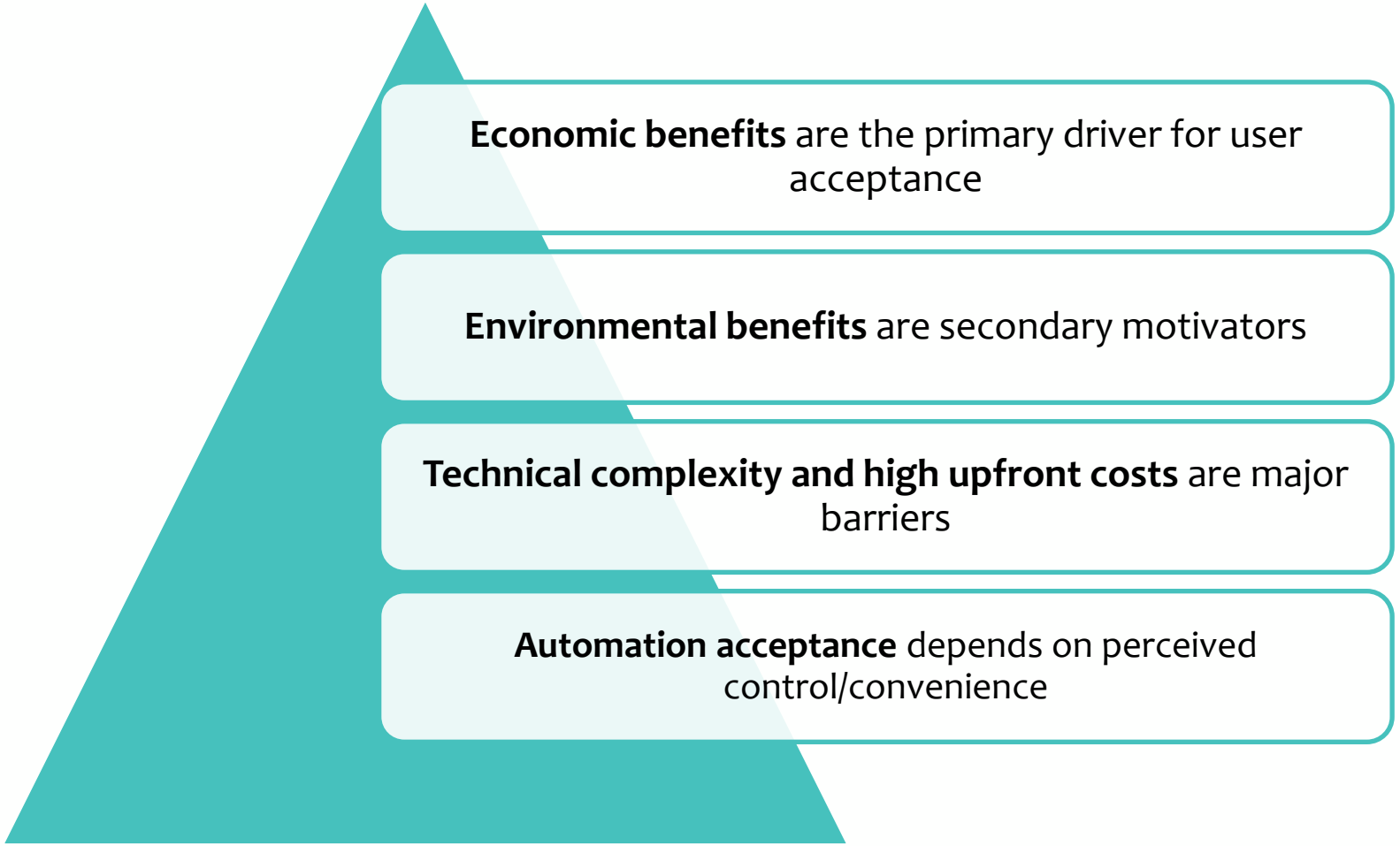
Key Insights from Surveys across 4 European countries (Denmark, France, Italy, Spain)



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Some recommended solutions for Islands

- Improved measurement and verification standards
- Affordable user-friendly automation solutions
- Simplified control interfaces
- Interoperability between systems

- Standardized frameworks
- Market products
- Dynamic pricing to better reflect cost

- Energy literacy and market understanding
- Transparent communication of costs/benefits
- Privacy preserving data handling
- Maintain user choice and control

- Lower entry barriers for small participants
- Clear definition of roles and responsibilities

European Commission


Thank you!