



**2<sup>nd</sup> Stakeholders Workshop**

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# Business Models and Regulatory and Market Barriers

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**Pablo Frías and Tomás Gómez**

IIT – Universidad Pontificia Comillas



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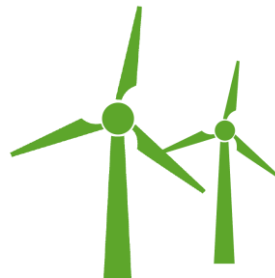




# Agenda

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- Introduction
- Business Models
- Feasibility of the Business Models
- Regulatory and Market Barriers
- Policy Recommendations



# Introduction



**Flexible Industrial  
Demand (FID)**



**Variable Renewable  
energy (VRE)**

## Flexibility business strategy

### Instruments

Flexible Demand

Contract with VRE  
generator

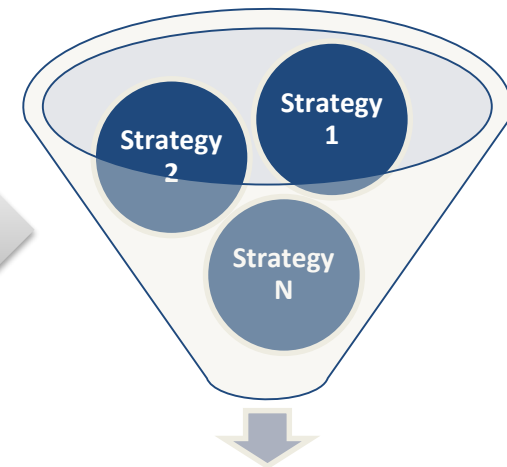
On-site VRE  
generation

### Savings / Revenues

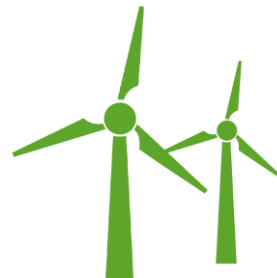
Energy costs

Network and other  
regulated charges

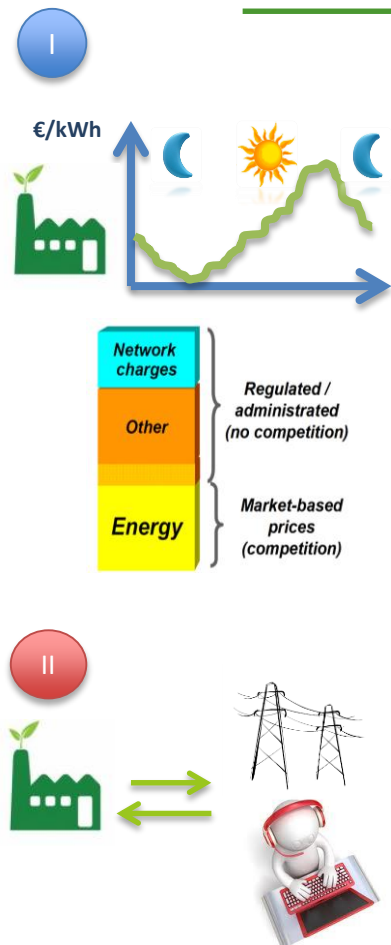
System services



**Business Model**



# Business Models



Savings/Revenues sources		Available tools		
		Flexible demand only	+ Contract with VRE generator	+ On-site VRE generation
Savings	Energy costs	<b>Supplier price response</b> (react to time-varying prices from a supplier); <b>Market price response</b> (react to real time market prices)	<b>III</b> <b>Long-term electricity supply</b> (establish long-term energy contract with VRE)	<b>V</b> <b>Long-term electricity supply</b> (through self-consumption)
	Network and other regulated charges	<b>TOU network tariff response</b> (reduce peak demand in accordance with network tariff structure)		<b>V</b> <b>Volumetric tariff response with on-site VRE</b> (reduce net demand)
Revenues	System services	<b>II</b> <b>Balancing service provision</b> (provide frequency control reserves and balancing services); <b>Other services provision</b> (capacity remuneration, load interruptibility, distribution network services)	<b>IV</b> <b>Bilateral balancing service provision</b> (establish flexibility contract to support VRE balance)	



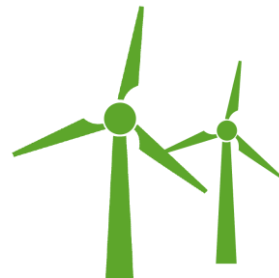
# Feasibility of the Business Models



■ **Model I (Electricity Bill reduction):** **feasible** and implemented in all target countries.



■ **Model II (System Service Provider):** growing EU trend to modify the design of ancillary services and balancing energy markets to allow the participation of demand-side resources but **some barriers remain**. Capacity remuneration mechanisms gradually introduced. Load interruptibility programs present in all target countries (significant source of income for industrial consumers).



# Feasibility of the Business Models



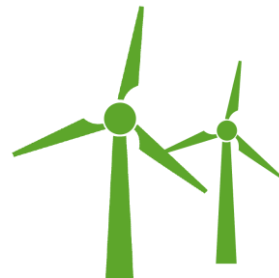
- **Model III (Electricity Supply Contract with off-site VRE):**  
**feasible** but still only **hypothetical** nowadays in the European context because of VRE support schemes.



- **Model IV (Balancing Service Contract with off-site VRE):**  
even though VRE generators are balance responsible, **not** generally **possible or attractive** because of the design of imbalance settlement arrangements.



- **Model V (Electricity Bill Reduction with on-site VRE):**  
**could be** an **attractive** decision for the FID in some countries although exemptions from paying certain regulated charges on self-consumed energy are being gradually eliminated or cut down (e.g. Spain).

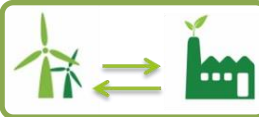


# Regulatory and Market Barriers



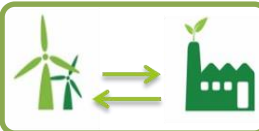
## **Model II (System Service Provider)**

- Demand not allowed to provide capacity reserves and balancing products
- Tight access rules and strict preconditions to bid capacities and energy
- No specific rules on rights and obligations of aggregators in the electricity market
- Mechanisms for this ancillary services at the distribution level not implemented



## **Model III (Electricity Supply Contract with off-site VRE):**

- VRE support schemes that decouple VRE operators from actual market conditions and therefore disincentive competitiveness the establishment of long-term bilateral contracts to minimize risk exposure



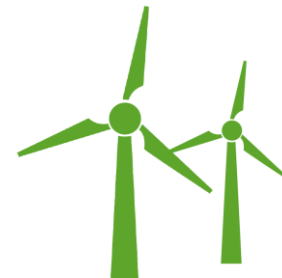
## **Model IV (Balancing Service Contract with off-site VRE)**

- Not allowing aggregation and compensation of imbalances from different consumption and generation units within a BRP area
- Single imbalance pricing provides little incentive to aggregation of generation and demand



## **Model V (Electricity Bill Reduction with on-site VRE)**

- Some grid-tariff exemptions on self-consumed energy being cut down or eliminated

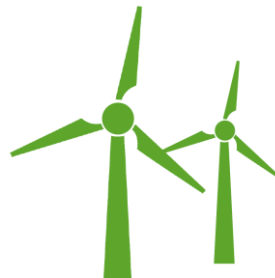


# Policy recommendations (i)

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## ■ Model I: Electricity Bill Reduction

1. Large consumers access to wholesale electricity markets
2. Ensure that tariff design for network costs is based on cost-causality
3. Network tariffs: fixed (€) + capacity time dependent (€/kW)
4. Non-electricity regulated charges out of the tariff





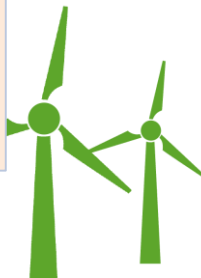
# Policy recommendations (ii)

## ■ Model II: System Service Provider

5. Allow participation of demand in reserve and balancing markets
6. Guarantee **fair technical conditions** for demand into these markets



- Reduce minimum bid sizes
- Allow aggregated loads
- Separate reserve capacity & balancing energy
- Separate upward & downward balancing products
- Facilitate financial adjustments between involved parties

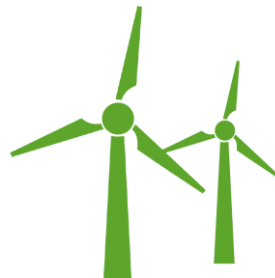


## Policy recommendations (iii)

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- Model IV: Balancing Service Contract with off-site VRE

7. Require VRE generators to bear imbalance responsibility
8. Move towards a single imbalance pricing system
9. In the case of remaining in a dual imbalance pricing system, allow aggregation and imbalance compensation

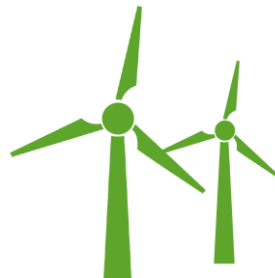


# Policy recommendations (iv)

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- Model II: System Service Provider

10. Allow and facilitate consumer involvement in existing capacity remuneration mechanisms
11. Make load interruptibility mechanisms competitive
12. Promote an active network management by DSOs with provision of local services by FID



# Policy recommendations (v)

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- Model V: Electricity Bill Reduction with on-site VRE

13. Abandon net-metering policies and allow self-consumption for on-site VRE

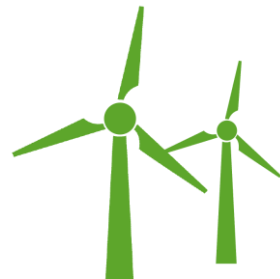
- EU Harmonization

14. Harmonization of flexibility mechanisms across the EU





Thank you





Imperial College  
London

