

Improved Security of Electricity Supply by Demand Flexibility (DemandFlex)

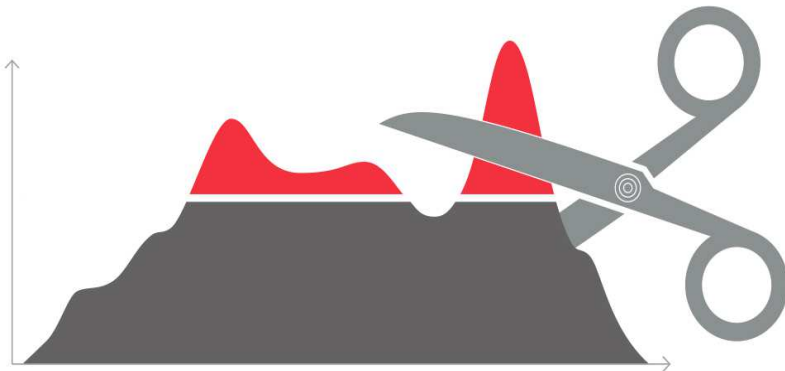
Kick-off meeting of DemandFlex project

08 November 2021

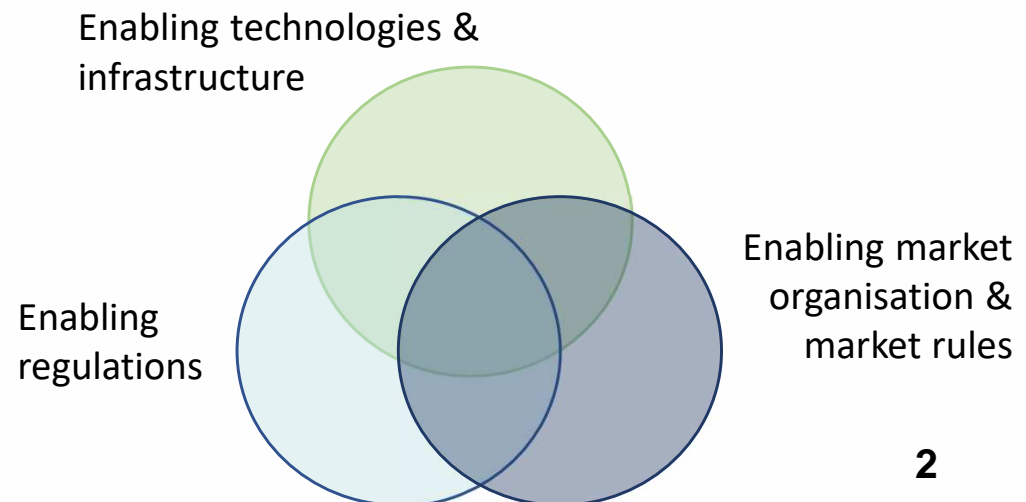
Project objectives

DemandFlex aims to study the **legal, economic and technical obstacles** to the **full exploitation of the flexibility potential of demand** to ensure the balance between electricity production and demand, **provide solutions** to the obstacles identified and demonstrate the beneficial effect of these solutions on the security of electricity supply and on the transmission network.

Why demand flexibility ?



Why a multi-disciplinary perspective?



Senior scientific team



Estelle Cantillon, co-PI (Ph.D. Economics)

- Expertise in market design with appln to financial markets, emissions markets and electricity markets
- Research combines theoretical modelling and data analysis



Pierre Henneaux, co-PI (Ph.D. Electrical Engineering)

- Expertise in power system reliability (adequacy, security), power system planning and electricity markets
- Research based mainly on modelling & simulation



Mohammad Moradzadeh (Ph.D. Electrical Engineering), Research Manager

- Expertise in optimisation of elec. power syst, modelling and simulation
- Research includes smart grids, μ -grids, & integration of RES



Emmanuel Slautsky, co-PI (Ph.D. Law)

- Expertise in European and Belgian public law
- Research on the regulation and the governance of electricity markets

Junior scientific team



Marie Beudels

- MA in Law (U Liège, 2019), LLM Harvard (2020)
- Currently at the Brussels bar and legal research at KU Leuven
- Joining ULB as Ph.D. student in Jan 2022



Leticia Pieraerts (Ph.D. student in Economics)

- MSc Economic Analysis & European Policy ULB 2021, QTEM at TU Munich & U. of Porto



XXX (Ph.D. student in Electrical Engineering)

- Still to be recruited



XXX (Ph.D. student in Economics)

- Still to be recruited

Project structure

WP0: Project management & dissemination

WP1: Definition of common framework

WP2: Legal

WP3 Economic

WP4 Technical



WPO - General project management and dissemination

- documenting/finalizing deliverables, annual progress reports & costs;
- organizing regular project meetings with team members to track the progress;
- creating a dedicated website for the project;
- organizing joint workshops with other ETF projects such as FlexSys;
- organizing summer school(s);
- publication/presentation of the project findings in conferences and journals;
- publication of the final project results as a book

WP1 - Definition of a common framework

- **Objectives**

- Ensure synergies between the three disciplines
- Establish solid foundations for the state-of-the-art about demand flexibility and associated challenges
- Ensure consistency across the project through common case studies

- **Tasks**

- Task 1.1. Identification of the legal, economic and technical aspects related to the flexibility of demand in Belgium
 - October 2021 → June 2022
- Task 1.2. Definition of case studies
 - April 2022 → October 2022

WP2 - Legal aspects

- **Objectives**

- assessing whether the existing Belgian governance/legal framework is fit for allowing the full potential of demand flexibility to be deployed
- making recommendations for further reform

- **Tasks**

- Task 2.1: analysing the governance of demand flexibility
 - April 2022 → March 2024
- Task 2.2: analysing the rules organising and regulating demand flexibility
 - October 2023 → March 2026

- **Synergies**

- WP3 and WP4

WP3 - Economic aspects

- **Objectives**

Investigate how market rules and economic governance can foster demand flexibility

- Assess **current** situation (ancillary, wholesale and retail)
- Assess **potential** (optimal market design) and compatibility with current and upcoming legal frameworks

- **Tasks**

- Definition of market neutrality (technology, business models) → input to optimal market design
- Demand-side contribution to wholesale market (smart bids)
- Retail contribution to demand flexibility: ToU tariffication

- **Synergies**

- WP2.2 and WP3.1, WP 3.3. and WP 4.1 and WP 4.3

WP4 - Technical aspects

- **Objectives**

- Alleviate technical barriers hampering demand response
- Demonstrate quantitatively the benefits of demand response on the security of supply

- **Tasks**

- Real-time monitoring of loads that can provide flexibility
- Participation of the demand to frequency control
- Optimal load scheduling
- Impact on the level of adequacy and on the level of security

- **Synergies**

- WP2: task 2.2
- WP3: tasks 3.2 & 3.3

Priorities for first year

- **Build knowledge base of team**
 - Local environment: case studies, brownbag lunches
 - Existing practices abroad: case studies, literature surveys
 - Technical expertise: doctoral training
 - Cross-disciplinary dialogue: brown bag lunches, team meetings
- **Engage with local stakeholders**
 - 2-way dialogue: briefings and case studies, brown bag lunches
 - Data access
- **Engage with wider research community**
 - Dissemination: publications, doctoral summer school
 - Exchange: research workshops, seminars

Project timeline, Work Packages, Tasks & Deliverables

	Année 1				Année 2				Année 3				Année 4				Année 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WPs																				
WPO																				
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T0.2																				
T0.3																				
WP1																				
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D0.2							X													
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D0.4											X									
D0.5															X					
D1.1			X																	
D1.2				X																
D2.1									X											
D2.2																	X			
D3.1											X									
D3.2													X							
D3.3															X					
D4.1							X													
D4.2									X											
D4.3											X									
D4.4													X							

DemandFlex Project WPs and Tasks

WP0 - General project management and dissemination

Task 0.1: Project coordination and management

Task 0.2: Interactions with stakeholders

Task 0.3: Confidential data and intellectual property management

WP1 - Definition of a common framework

Task 1.1. Identification of the legal, economic and technical aspects related to the flexibility of demand in Belgium

Task 1.2. Definition of case studies

WP2 - Legal aspects

Task 2.1. The distribution of competences in terms of flexibility of demand

Task 2.2. The legal regime for demand flexibility tools

WP3 - Economic component

Task 3.1. Concept of neutrality of market and regulatory mechanisms

Task 3.2. Contribution of demand to the wholesale market: Smart bids

Task 3.3. Retail Market: The Potential of Time-of-Use Pricing

WP4 - Technical section

Task 4.1: Real-time monitoring of loads that can provide flexibility

Task 4.2: Participation of the demand to frequency control

Task 4.3: Optimal load scheduling

Task 4.4: Impact on the level of adequacy and on the level of security



Thank
you