

PtH4GR²ID

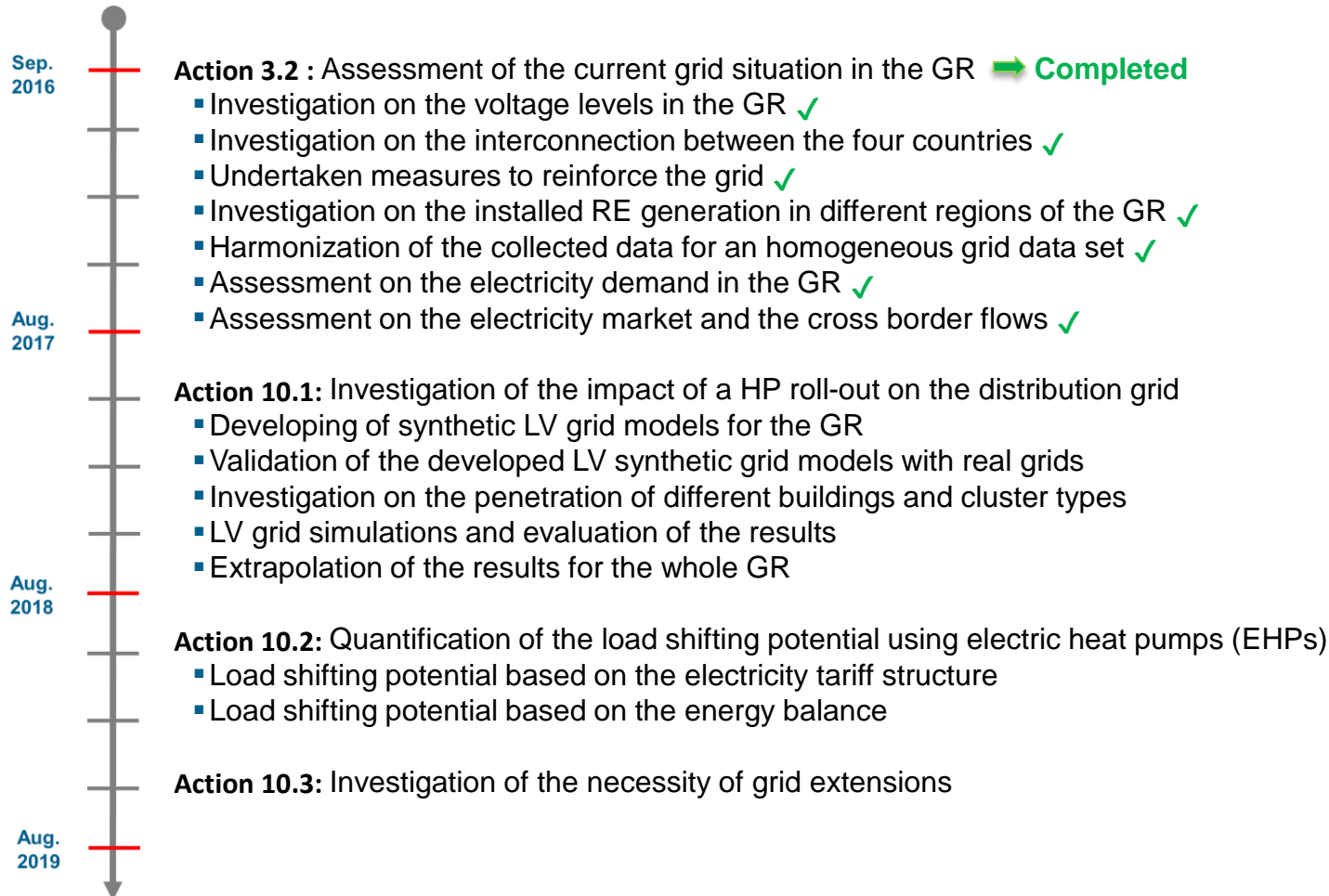
Power to Heat for the Greater Region's Renewables Integration and Development

Report summary Sub-action 3.2

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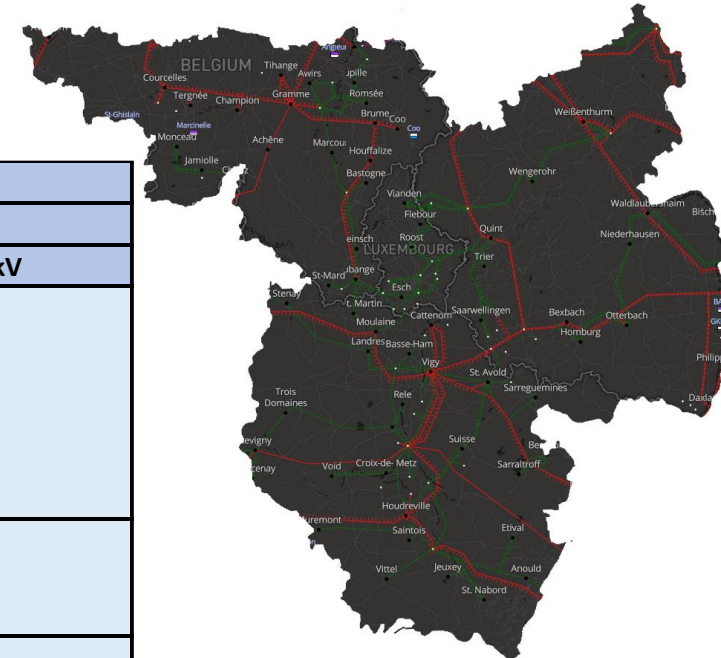


Overview | ESEM Action plan



Voltage levels in the GR

	Voltage Level in [kV]*		
	LV	MV	HV
	Un < 1 kV	1 kV ≤ Un ≤ 36 kV	Un > 36 kV
Belgium	0.4	5.5	70
		6	110
		10	150
		11	220
		15	380
		36	
Germany	0.4	10	110
		20	220
		30	380
France	0.4	15	63
		20	90
		33	150
			220
			380
Luxemburg	0.4	5	65
		20	220



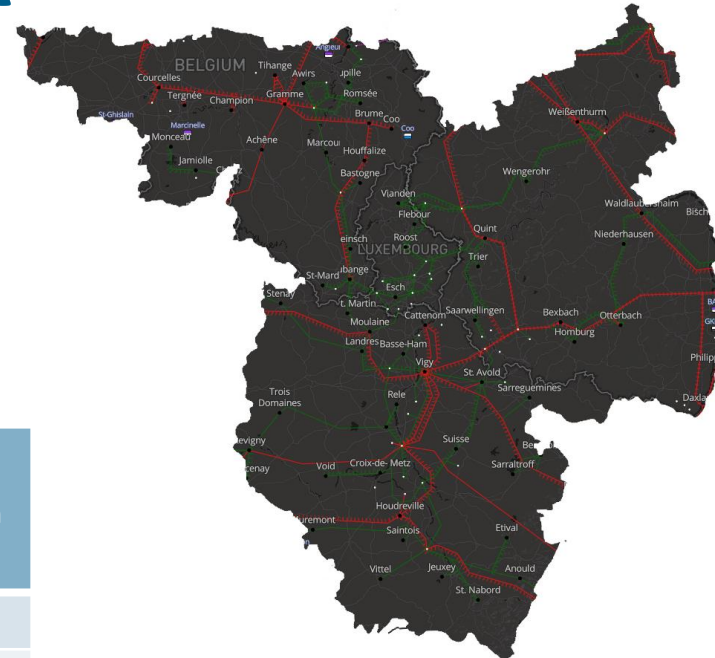
Source: www.entsoe.eu

* Voltage levels according to European standardization bodies CEN/CENELEC

Source: ENTSOE, Creos, Synergrid, Eurelectric, RTE, Elia

Interconnections in the GR

- No interconnections on the LV and MV levels
- No public network interconnections between
LU <-> FR and DE <-> BE on the HV level



Source: www.entsoe.eu

Interconnections			Number of Transmission lines 380 kV	Number of transmission lines 220 kV
Germany	↔	Luxemburg	0	2
Germany	↔	France	3	2
Germany	↔ ¹	Belgium	0	0
France	↔ ²	Luxemburg	0	0
France	↔	Belgium	2	2
Belgium	↔ ³	Luxemburg	0	2

- ¹ DC line is under construction
- ² 150 kV Providing the industrial zone in Sotel (ArcelorMittal)
- ³ 2 x 220 kV Providing the industrial zone in Sotel / 2 x 220 kV between Aubagne and Bascharge is planned

Source: www.entsoe.eu

Interconnections in the Greater Region – Status 2017

Undertaken measures

■ Transmission level

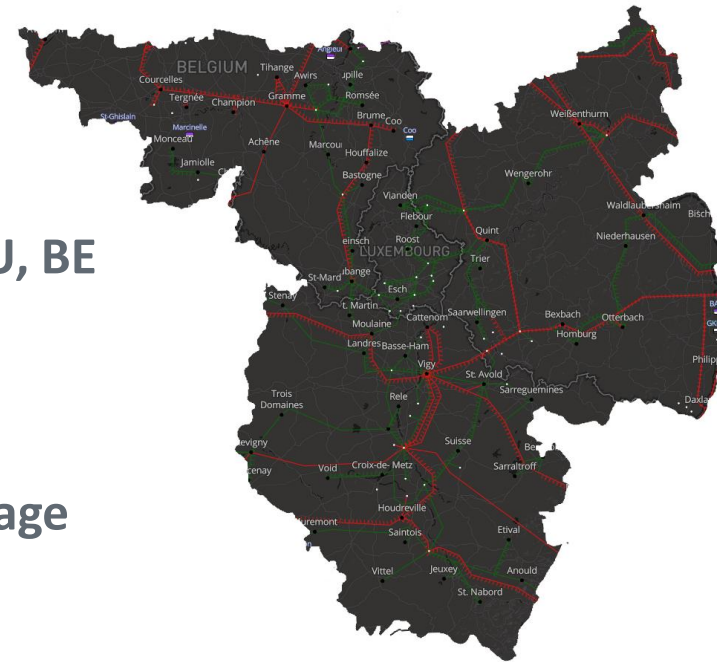
- Phase shifting transformer between DE, LU, BE
- Transmission grid extension in Luxemburg (Projekt Luxring)
- DC interconnection between BE and DE
- 2 x 220 kV between Aubagne and Bascharage

■ Distribution level

- Smart Meter rollout in LU (until the end of 2019)

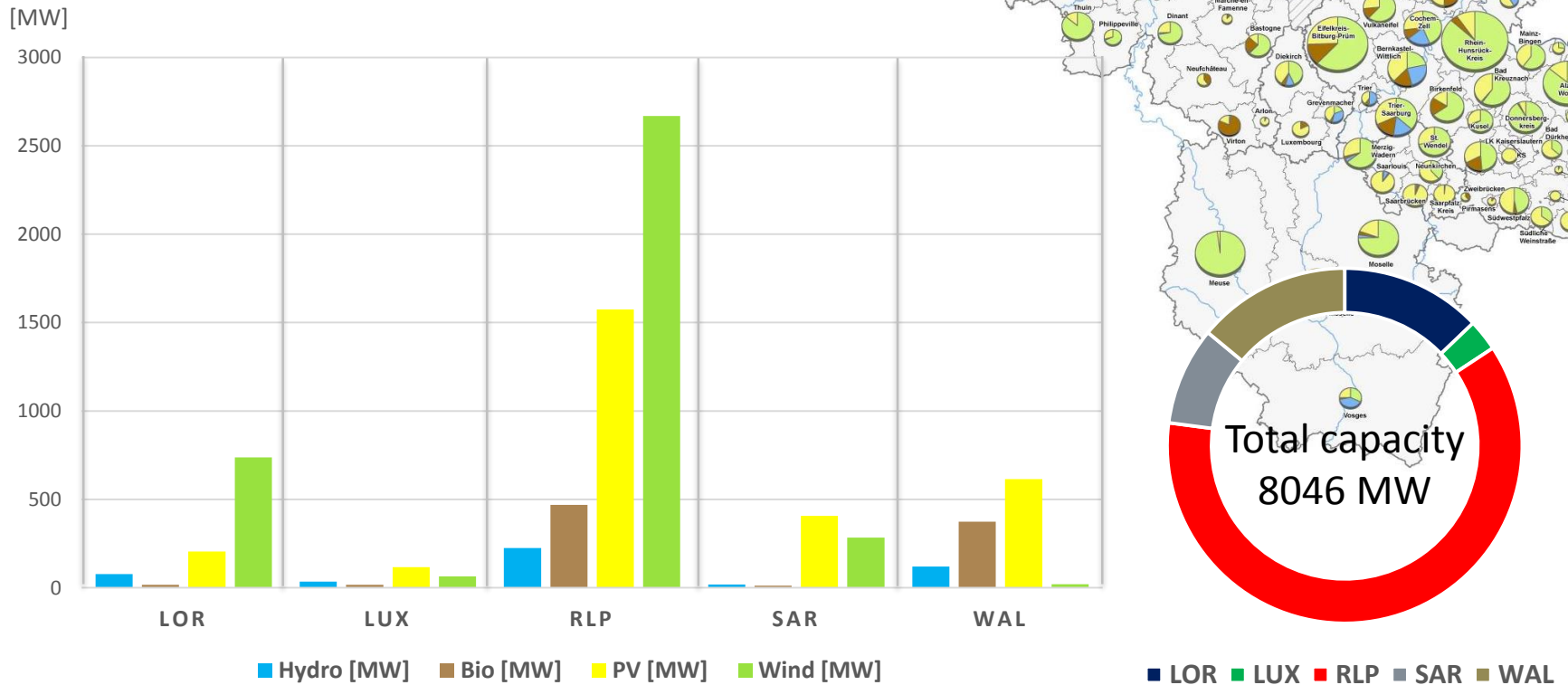
■ Electricity Market

- Capacity market in France (since January 2017)



Source: www.entsoe.eu

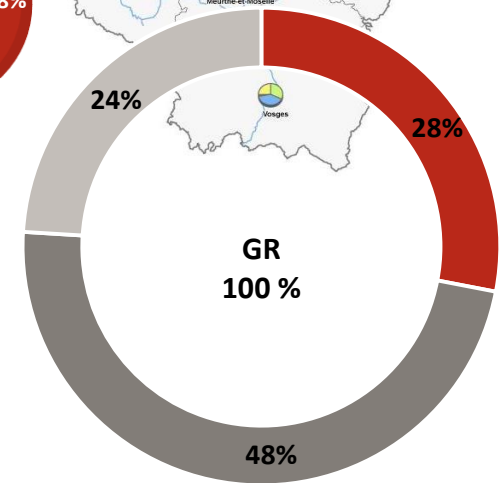
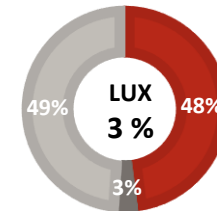
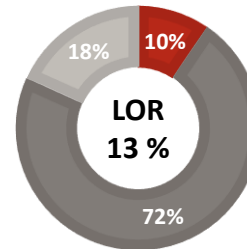
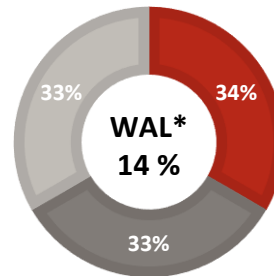
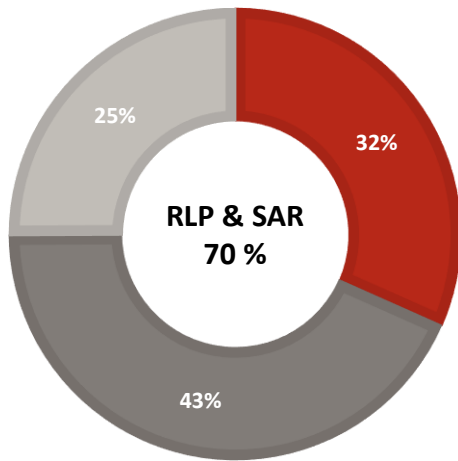
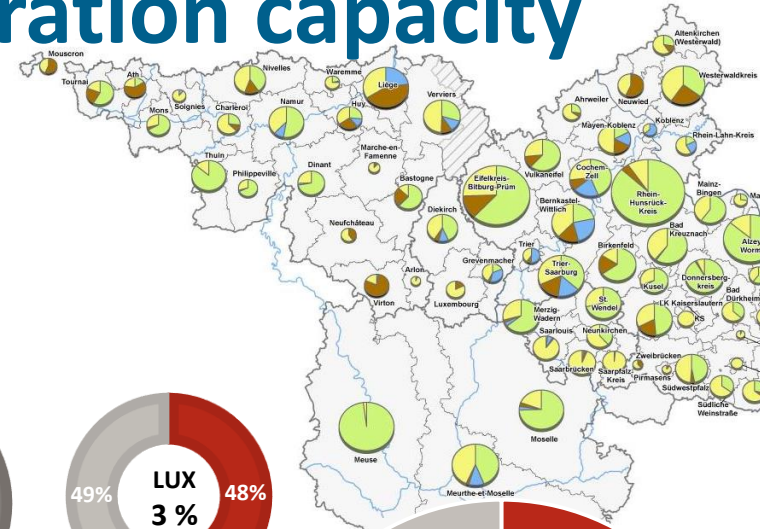
Installed renewable generation capacity



Source: www.sig-gr.eu

Installed power capacity of renewable energy in the Greater Region in 2015 in MW

Installed renewable generation capacity



Source: BNetzA, RTE, Creos and ILR

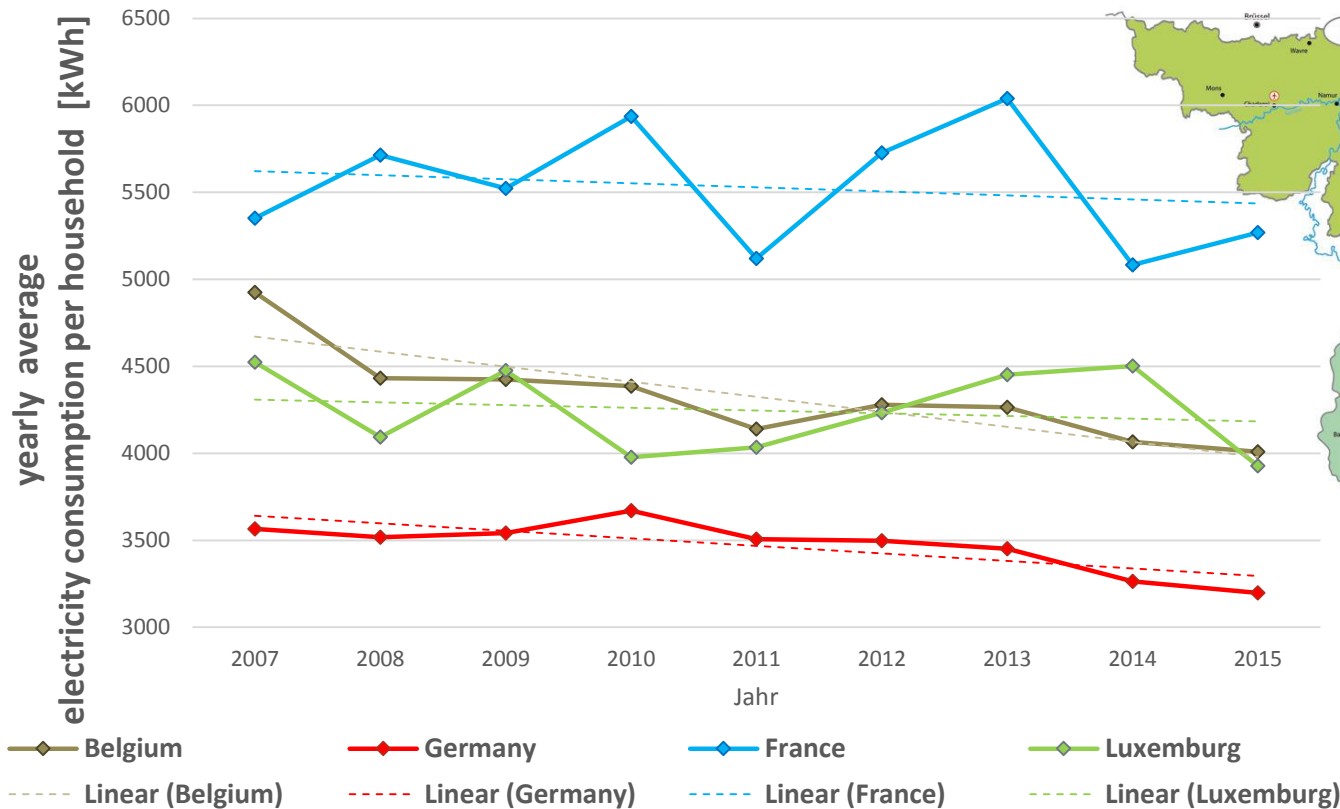
Share of renewable energy in each voltage level in the Greater Region in 2016**

* No data found. Still waiting for Input from Ulg_BEMS.

** The share is based on country-wide data, as such data are not available for the GR.

■ HV ■ MV ■ LV

Electricity consumption in the GR



Source: www.tourismus-grossregion.eu

Average electricity consumption per household in kWh/a*

* Based on country-wide data, as such data are not available for the GR.

Source: Eurostat.eu

Electricity market and cross border flows

■ Bidding zones in the GR

- France
- Belgium
- Germany/Luxemburg/Austria

→ The combined power market is projected to be split in October 2018

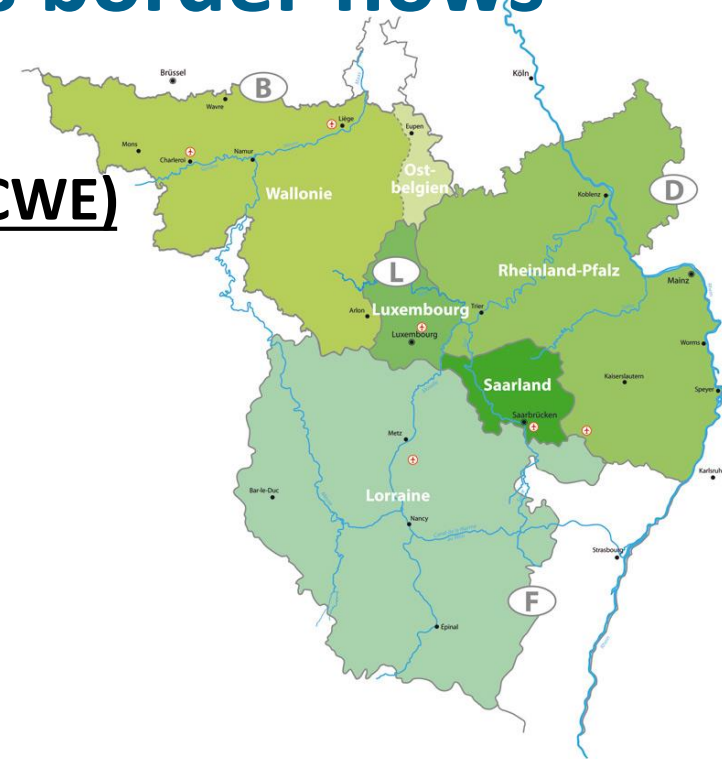
■ Electricity market designs

- Energy only market: DE/LU/AU, Belgium
- Capacity market: France



Electricity market and cross border flows

- **Physical flow in Central West Europe (CWE)**
 - Total volume of 44 TWh in 2016
- **The predominant directions**
 - FR→DE (79% of the total physical flow through the border)
 - BE →FR (52% of the total physical flow through the border)
- **Direction change**
 - 793 times between FR and DE in 2016 (hourly basis)



Thank you for your Attention!

