

Baltic Energy Market
Interconnection Plan
GRIP

ANNEX B: MODELLING RESULTS

Amber
Grid



conexus
BAL TIC GRID

elering

ENERGINET

Gasum

GAZ
system

SWEDEGAS

Remaining Flexibility

This indicator measures the resilience of a Zone as the additional share of demand each country is able to cover before no longer being able to fulfil its demand without creating new demand curtailment in other Zones. The value of the indicator is set as the possible increase in demand of the Zone before an infrastructure or supply limitation is reached somewhere in the European gas system.

This indicator will be calculated under 1-day Design Case and 14-day Uniform Risk situations with and without supply stress.

BLUE TRANSITION SCENARIO											
			DC	DC	DC	2-W	2-W	2-W			DC
	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	Infrastructure	Disruption	2017
FI	Low + GIPL	No RU supply to FI and the Baltic states	0.00	0.00	0.00	0.00	0.00	0.00	Low + PCI projects in the Baltic states (EE, LV, LT)	No RU supply to FI and the Baltic states	0.00
EE			0.00	0.18	0.00	0.22	0.47	0.00			0.00
LV			0.00	0.29	0.00	0.06	0.45	0.00			0.00
LT			0.00	0.34	0.00	0.07	0.64	0.00			0.00
PL			0.56	0.28	0.16	0.66	0.39	0.23			0.56
DK			0.05	0.19	0.07	0.17	0.32	0.18			0.05
SE			0.08	0.05	0.06	0.15	0.11	0.12			0.08
FI		No RU supply to the Baltic States	0.29	1.00	1.00	0.95	1.00	1.00		No RU supply to the Baltic States	0.29
EE			0.00	0.18	0.00	0.22	0.47	0.00			0.00
LV			0.00	0.29	0.00	0.06	0.45	0.00			0.00
LT			0.00	0.34	0.00	0.07	0.64	0.00			0.00
PL			0.56	0.28	0.16	0.66	0.39	0.23			0.56
DK			0.05	0.19	0.07	0.17	0.32	0.18			0.05
SE			0.08	0.05	0.06	0.15	0.11	0.12			0.08
FI		No supply from BY to LT	0.29	1.00	1.00	0.95	1.00	1.00		No supply from BY to LT	0.29
EE			0.55	1.00	0.00	1.00	1.00	0.12			0.55
LV			0.17	0.56	0.00	0.32	0.70	0.01			0.17
LT			0.19	0.66	0.00	0.41	0.99	0.02			0.19
PL			0.56	0.33	0.16	0.66	0.43	0.23			0.56
DK			0.05	0.19	0.07	0.17	0.32	0.12			0.05
SE			0.08	0.05	0.06	0.15	0.11	0.12			0.08

The Remaining Flexibility of the Zone Z is calculated as follows

(steps 2 and 3 are repeated independently for each Zone):

1. Modelling of the European gas system under a given climatic case
2. Increase demand of Zone Z by 100 %
3. Modelling of the European gas system in this new case

The Remaining Flexibility of the considered Zone is defined as 100% minus the percentage of disruption of the additional demand.

The higher the value, the better the resilience is. A zero value would indicate that the Zone is not able to fulfil its additional demand and a 100 % value would indicate that it is possible to supply a demand multiplied by a factor two.

DC	DC	2-W	2-W	2-W			DC	DC	DC	2-W	2-W	2-W	
2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	
0.00	0.00	0.00	0.00	0.00	Low + PCI projects in BEMIP GRIP countries	No RU supply to FI and the Baltic states	0.00	0.00	0.00	0.00	0.00	0.06	FI
1.00	1.00	0.22	1.00	1.00			0.00	0.90	0.12	0.22	1.00	0.17	EE
0.68	0.29	0.06	0.77	0.24			0.00	0.28	0.04	0.06	0.44	0.05	LV
0.26	0.00	0.07	0.52	0.02			0.00	0.26	0.00	0.07	0.52	0.02	LT
0.30	0.22	0.66	0.38	0.31			0.56	0.30	0.22	0.66	0.38	0.31	PL
0.19	0.07	0.17	0.32	0.18			0.05	0.19	0.16	0.17	0.32	0.28	DK
0.05	0.06	0.15	0.11	0.12			0.08	0.05	0.33	0.15	0.11	0.42	SE
1.00	1.00	0.95	1.00	1.00		No RU supply to the Baltic States	0.29	1.00	1.00	0.95	1.00	1.00	FI
1.00	1.00	0.22	1.00	1.00			0.00	1.00	1.00	0.22	0.47	1.00	EE
0.68	0.29	0.06	0.77	0.24			0.00	0.75	0.29	0.06	0.45	0.24	LV
0.26	0.00	0.07	0.52	0.02			0.00	0.26	0.00	0.07	0.64	0.02	LT
0.30	0.22	0.66	0.38	0.31			0.56	0.30	0.22	0.66	0.39	0.31	PL
0.19	0.07	0.17	0.32	0.18			0.05	0.19	0.16	0.17	0.32	0.28	DK
0.05	0.06	0.15	0.11	0.12			0.08	0.05	0.33	0.15	0.11	0.42	SE
1.00	1.00	0.95	1.00	1.00	No supply from BY to LT	0.29	1.00	1.00	0.95	1.00	1.00	FI	
1.00	1.00	1.00	1.00	1.00		0.55	1.00	1.00	1.00	1.00	1.00	EE	
0.70	0.29	0.32	0.77	0.24		0.17	0.75	0.29	0.32	0.88	0.24	LV	
0.26	0.00	0.41	0.52	0.02		0.19	0.26	0.00	0.41	0.52	0.02	LT	
0.30	0.22	0.66	0.38	0.31		0.56	0.30	0.22	0.66	0.38	0.31	PL	
0.19	0.07	0.17	0.32	0.18		0.05	0.19	0.16	0.17	0.32	0.28	DK	
0.05	0.06	0.15	0.11	0.12		0.08	0.05	0.33	0.15	0.11	0.42	SE	

GREEN SCENARIO											
			DC	DC	DC	2-W	2-W	2-W			
	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	Infrastructure	Disruption	2017
FI	Low + GIPL	No RU supply to FI and the Baltic states	0.00	0.00	0.00	0.00	0.00	0.00	Low + PCI projects in the Baltic states (EE, LV, LT)	No RU supply to FI and the Baltic states	0.00
EE			0.00	0.42	0.00	0.15	0.76	0.00			0.00
LV			0.00	0.35	0.00	0.04	0.48	0.00			0.00
LT			0.00	0.42	0.00	0.05	0.67	0.00			0.00
PL			0.63	0.57	0.43	0.73	0.70	0.51			0.63
DK			0.08	0.30	0.32	0.22	0.46	0.45			0.08
SE			0.10	0.10	0.21	0.15	0.13	0.21			0.10
FI		No RU supply to the Baltic States	0.43	1.00	1.00	1.00	1.00	1.00		No RU supply to the Baltic States	0.43
EE			0.00	0.42	0.00	0.15	0.76	0.00			0.00
LV			0.00	0.35	0.00	0.04	0.48	0.00			0.00
LT			0.00	0.42	0.00	0.05	0.67	0.00			0.00
PL			0.63	0.57	0.43	0.73	0.70	0.51			0.63
DK			0.08	0.30	0.32	0.22	0.46	0.45			0.08
SE			0.10	0.10	0.21	0.15	0.13	0.21			0.10
FI		No supply from BY to LT	0.43	1.00	1.00	1.00	1.00	1.00		No supply from BY to LT	0.43
EE			0.62	1.00	0.38	1.00	1.00	0.62			0.62
LV			0.19	0.61	0.00	0.28	0.70	0.00			0.19
LT			0.21	0.71	0.00	0.36	0.95	0.00			0.21
PL			0.63	0.63	0.43	0.73	0.75	0.51			0.63
DK			0.08	0.30	0.32	0.22	0.46	0.45			0.08
SE			0.10	0.10	0.21	0.15	0.13	0.21			0.10

DC	DC	2-W	2-W	2-W									
2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	
0.00	0.00	0.00	0.00	0.00	Low + PCI projects in BEMIP GRIP countries	No RU supply to FI and the Baltic states	0.00	0.00	0.12	0.00	0.33	0.53	FI
1.00	1.00	0.15	1.00	1.00			0.00	1.00	0.94	0.15	1.00	1.00	EE
0.70	0.29	0.04	0.73	0.19			0.00	0.32	0.19	0.04	0.53	0.21	LV
0.26	0.00	0.05	0.49	0.00			0.00	0.26	0.00	0.05	0.49	0.00	LT
0.59	0.51	0.73	0.69	0.61			0.63	0.59	0.51	0.73	0.68	0.61	PL
0.30	0.31	0.22	0.46	0.43			0.08	0.30	0.43	0.22	0.46	0.58	DK
0.10	0.21	0.15	0.13	0.21			0.10	0.10	0.48	0.15	0.13	0.51	SE
1.00	1.00	1.00	1.00	1.00			No RU supply to the Baltic States	0.43	1.00	1.00	1.00	1.00	1.00
1.00	1.00	0.15	1.00	1.00		0.00		1.00	1.00	0.15	1.00	1.00	EE
0.70	0.29	0.04	0.73	0.19		0.00		0.73	0.29	0.04	0.80	0.21	LV
0.26	0.00	0.05	0.49	0.00		0.00		0.26	0.00	0.05	0.49	0.00	LT
0.59	0.51	0.73	0.69	0.61		0.63		0.59	0.51	0.73	0.68	0.61	PL
0.30	0.31	0.22	0.46	0.43		0.08		0.39	0.43	0.22	0.46	0.58	DK
0.10	0.21	0.15	0.13	0.21		0.10		0.10	0.48	0.15	0.13	0.51	SE
1.00	1.00	1.00	1.00	1.00		No supply from BY to LT		0.43	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00			0.62	1.00	1.00	1.00	1.00	1.00	EE
0.70	0.29	0.28	0.73	0.19			0.19	0.73	0.29	0.28	0.80	0.21	LV
0.26	0.00	0.36	0.49	0.00			0.21	0.29	0.00	0.36	0.49	0.00	LT
0.59	0.51	0.73	0.69	0.61			0.63	0.59	0.51	0.73	0.68	0.61	PL
0.30	0.31	0.22	0.46	0.43			0.08	0.30	0.43	0.22	0.46	0.58	DK
0.10	0.21	0.15	0.13	0.21			0.1	0.1	0.48	0.15	0.13	0.51	SE

Disrupted Demand (DD) and Disrupted Rate (DR)

The amount of disrupted demand for a given Zone is provided:

- ▲ In energy (DD)
- ▲ As relative share/percentage (DR)

This amount is calculated in a Cooperative mode, that is, under the flow pattern maximising the spreading of the disrupted demand (in order to reduce the relative impact on each Zone). This means that, if possible, all the Zones will share the same disrupted rate.

BLUE TRANSITION SCENARIO												
			DC	DC	DC	2-W	2-W	2-W				
	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	
FI	Low + GIPL	No RU supply to FI and the Baltic states	1.00	0.99	0.96	1.00	0.98	0.94	Low + PCI projects in the Baltic states (EE, LV, LT)	No RU supply to FI and the Baltic states	1.00	
EE			0.06		0.18			0.14			0.06	
LV			0.04		0.18			0.12			0.04	
LT			0.06		0.19			0.13			0.06	
PL												
DK												
SE												
FI		No RU supply to the Baltic States									No RU supply to the Baltic States	
EE			0.06		0.18	0.00		0.14		0.06		
LV			0.04		0.18			0.12		0.04		
LT			0.06		0.19			0.13		0.06		
PL												
DK												
SE				0.00			0.00					
FI		No supply from BY to LT									No supply from BY to LT	
EE					0.06							
LV					0.05							
LT					0.07			0.00				
PL												
DK												
SE				0.00	0.00		0.00	0.00				

DC	DC	2-W	2-W	2-W			DC	DC	DC	2-W	2-W	2-W			
2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025			
0.99	0.96	1.00	0.98	0.94	Low + PCI projects in BEMIP GRIP countries	No RU supply to FI and the Baltic states	1.00	0.30	0.23	1.00	0.04	0.00	FI		
							0.06								EE
							0.04								LV
	0.16						0.06		0.16						LT
															PL
															DK
															SE
						No RU supply to the Baltic States								FI	
		0.00					0.06				0.00		0.14		EE
							0.04						0.12		LV
	0.16			0.00			0.06		0.16				0.13		LT
															PL
															DK
0.00			0.00						0.00			0.00			SE
						No supply from BY to LT								FI	
															EE
															LV
									0.16				0.00		LT
				0.00										PL	
														DK	
0.00	0.00	0.00	0.00				0.00	0.00		0.00				SE	

GREEN SCENARIO												
			DC	DC	DC	2-W	2-W	2-W				
	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	
FI	Low + GIPL	No RU supply to FI and the Baltic states	1.00	0.98	0.94	1.00	0.98	0.92	Low + PCI projects in the Baltic states (EE, LV, LT)	No RU supply to FI and the Baltic states	1.00	
EE			0.06		0.14			0.10			0.06	
LV			0.04		0.14			0.09			0.04	
LT			0.04		0.14			0.10			0.04	
PL												
DK												
SE												
FI		No RU supply to the Baltic States									No RU supply to the Baltic States	
EE			0.06		0.14	0.00	0.00	0.10		0.06		
LV			0.04		0.14			0.09		0.04		
LT			0.04		0.14			0.10		0.04		
PL												
DK												
SE												
FI		No supply from BY to LT									No supply from BY to LT	
EE												
LV					0.04							
LT					0.07			0.00				
PL												
DK												
SE												

DC															
DC	DC	2-W	2-W	2-W				DC	DC	DC	2-W	2-W	2-W		
2020	2025	2017	2020	2025	Infrastructure	Disruption	2017	2020	2025	2017	2020	2025			
0.98	0.94	1.00	0.98	0.92	Low + PCI projects in BEMIP GRIP countries	No RU supply to FI and the Baltic states	1.00	0.03		1.00			FI		
							0.06							EE	
							0.04								LV
	0.16			0.01			0.04		0.16				0.01		LT
															PL
															DK
															SE
								No RU supply to the Baltic States							FI
		0.00				0.06			0.00						EE
						0.04									LV
	0.16			0.01		0.04			0.16				0.01		LT
															PL
															DK
0.00								0.00						SE	
							No supply from BY to LT							FI	
															EE
															LV
	0.16			0.01					0.16				0.01		LT
															PL
															DK
0.00								0.00						SE	



Remaining Flexibility/NONE disruption (TYNDP 2017)

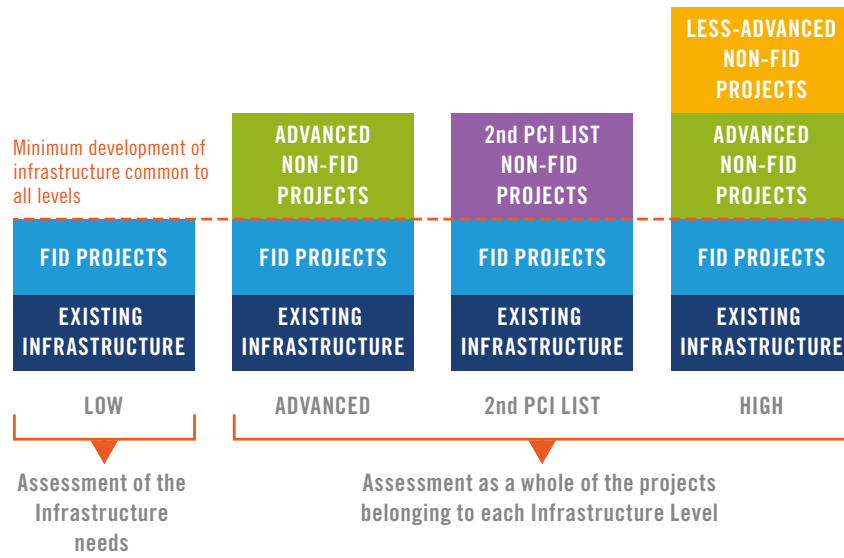
BLUE TRANSITION SCENARIO																							
		DC	DC	DC	2-W	2-W	2-W								DC	DC	DC	2-W	2-W	2-W			
	Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025		
FI	Low	0.29	1.00	1.00	0.95	1.00	1.00	Advanced	0.29	1.00	1.00	0.95	1.00	1.00	Advanced	0.29	1.00	1.00	0.95	1.00	1.00		
EE		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LV		0.74	0.68	0.69	0.76	0.70	0.72		0.74	1.00	1.00	1.00	0.76	1.00		1.00	0.74	1.00	1.00	1.00	1.00	1.00	1.00
LT		1.00	1.00	0.85	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PL		0.56	0.30	0.22	0.66	0.38	0.31		0.56	0.75	0.64	0.66	0.88	0.77									
DK		0.05	0.19	0.07	0.17	0.32	0.18		0.05	0.19	0.16	0.17	0.32	0.28									
SE		0.08	0.05	0.06	0.15	0.11	0.12		0.08	0.05	0.33	0.15	0.11	0.42									

GREEN EVOLUTION																						
		DC	DC	DC	2-W	2-W	2-W								DC	DC	DC	2-W	2-W	2-W		
	Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025	
FI	Low	0.29	1.00	1.00	0.95	1.00	1.00	Advanced	0.29	1.00	1.00	0.95	1.00	1.00	Advanced	0.29	1.00	1.00	0.95	1.00	1.00	
EE		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
LV		0.74	0.68	0.69	0.76	0.70	0.72		0.74	1.00	1.00	1.00	0.76	1.00		1.00	0.74	1.00	1.00	1.00	1.00	1.00
LT		1.00	1.00	0.85	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PL		0.56	0.30	0.22	0.66	0.38	0.31		0.56	0.75	0.64	0.66	0.88	0.77								
DK		0.05	0.19	0.07	0.17	0.32	0.18		0.05	0.19	0.16	0.17	0.32	0.28								
SE		0.08	0.05	0.06	0.15	0.11	0.12		0.08	0.05	0.33	0.15	0.11	0.42								

	DC	DC	DC	2-W	2-W	2-W		DC	DC	DC	2-W	2-W	2-W		
Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025		
2 nd PCI list	0.29	1.00	1.00	0.95	1.00	1.00	High	0.29	1.00	1.00	0.95	1.00	1.00	FI	
	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	EE
	0.74	1.00	1.00	0.76	1.00	1.00		0.74	1.00	1.00	0.76	1.00	1.00	1.00	LV
	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	LT
	0.56	0.75	0.83	0.66	0.87	0.99		0.56	0.75	1.00	0.66	0.87	1.00	1.00	PL
	0.05	0.19	0.50	0.17	0.32	0.69		0.05	0.19	0.51	0.17	0.32	0.71	0.71	DK
	0.08	0.05	0.33	0.15	0.11	0.42		0.08	0.05	0.33	0.15	0.11	0.42	0.42	SE

	DC	DC	DC	2-W	2-W	2-W		DC	DC	DC	2-W	2-W	2-W		
Infrastructure	2017	2020	2025	2017	2020	2025	Infrastructure	2017	2020	2025	2017	2020	2025		
2 nd PCI list	0.29	1.00	1.00	0.95	1.00	1.00	High	0.29	1.00	1.00	0.95	1.00	1.00	FI	
	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	EE
	0.74	1.00	1.00	0.76	1.00	1.00		0.74	1.00	1.00	0.76	1.00	1.00	1.00	LV
	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	LT
	0.56	0.75	0.83	0.66	0.87	0.99		0.56	0.75	1.00	0.66	0.87	1.00	1.00	PL
	0.05	0.19	0.50	0.17	0.32	0.69		0.05	0.19	0.51	0.17	0.32	0.71	0.71	DK
	0.08	0.05	0.33	0.15	0.11	0.42		0.08	0.05	0.33	0.15	0.11	0.42	0.42	SE

Infrastructure Levels







ENTSOG AISBL

Avenue de Cortenbergh 100
1000 Brussels, Belgium
Tel. +32 2 894 51 00

info@entsog.eu

www.entsog.eu