

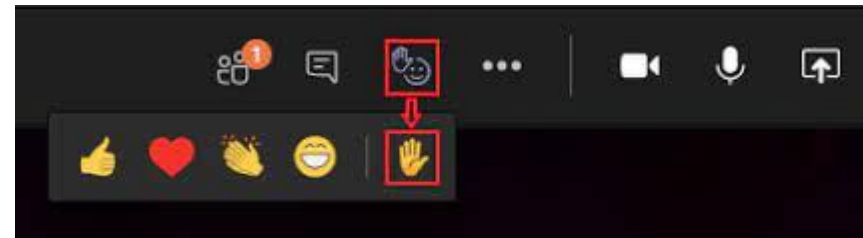
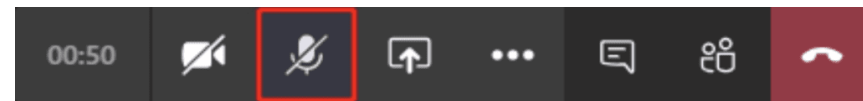
Opening

David Bakker | Gasunie Transport Services



House rules videoconference

- All audience participants will be muted by default. Please remain muted until invited by the moderator to speak.
- Please use a headset or earplugs for the best sound.
- Use the “raise hand” button if you have a question
- Short (simple) questions can also be asked in the chat
- Technical issues can be reported via chat



Agenda

- 9:30 – 10:00 Lines will open
- 10:00 – 10:10 Opening / **IP2022: process**
- 10:10 – 10:30 IP2022: capacity & quality methodology
- 10:30 – 11:15 Investment portfolio 2022, 2023 and further years / retrospect 2020
- 11:15 – 11:30 Coffee break
- 11:30 – 11:45 Development in the Dutch gas market: stock level storages
- 11:45 – 12:00 Wrap up

Investment Plan 2022

Process

Manasseh Struijck | Gasunie Transport Services



Objective

- Article 7a of the Gas Act states that network operators are obliged to write an investment plan (IP).
- With the IP, network operators offer an overview including justification of their investments in the short and long term.
- In 2018, national legislation was adopted, laying down further rules for both the status and the content of the investment plan.

Content and form of the IP 2022

- The IP contains, legally, the following three elements:
 - Developments in the energy market
 - Bottleneck analysis of the transport network
 - Description of investments in the transport network
 - Looking back on previous two years
 - Looking 5 and 10 years ahead
- GTS will publish an English and Dutch (official) version of the IP.

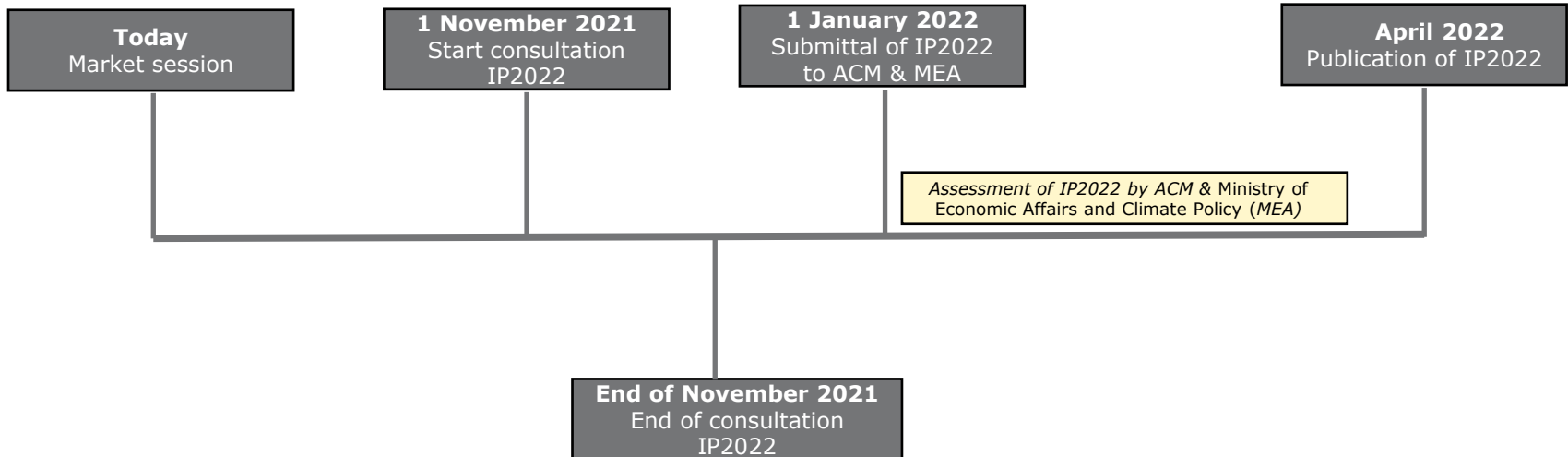
Stakeholders

- Market parties and representative organisations
 - Information session I: process and scenarios (November 2020)
 - Information session II: methodology and investments (September 2021)
 - Consultation IP 2022 (November 2021)
 - Publication of draft-IP on GTS website
- Dutch TSOs and DSOs
 - Continuous alignment
- NNO's
 - Within context subject/project
- ACM and Ministry of Economic Affairs and Climate Policy (MEA)
 - Continuous alignment

Deadline and period of validity

- Deadline for submission of the IP to ACM and the Minister of Economic Affairs and Climate Policy is 1st of January 2022 at the latest.
- Approval:
 - Ministry of Economic Affairs and Climate Policy : has GTS taken sufficient account of developments in the energy market?
 - ACM: could GTS reasonably have come to the draft investment plan and are the investments necessary?
- The investment plans are valid for a period of two years.
- GTS has an obligation to report in the event of a significant change via an addendum.

Milestones IP2022



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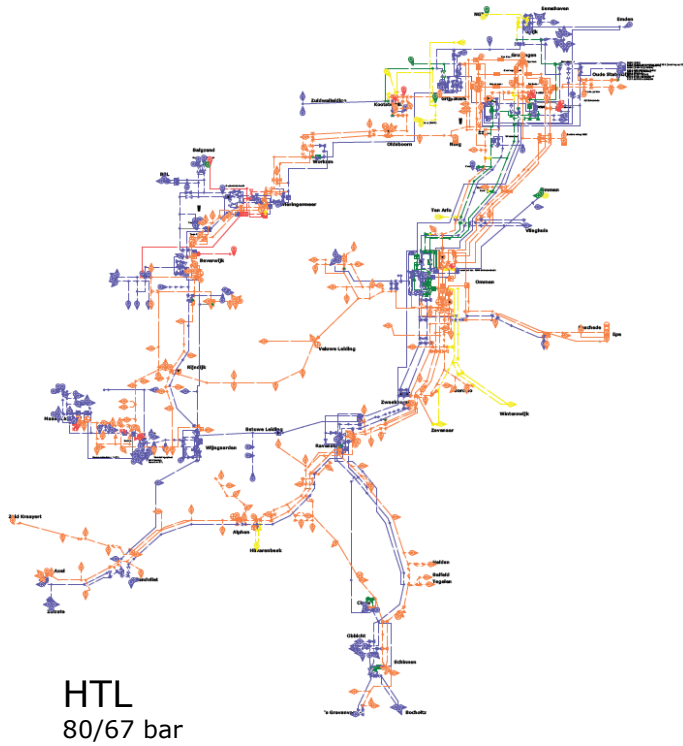
IP2022: Capacity Methodology

Determining capacities and bottlenecks in the entry/exit system of GTS

Wim Borghols | Gasunie Transport Services

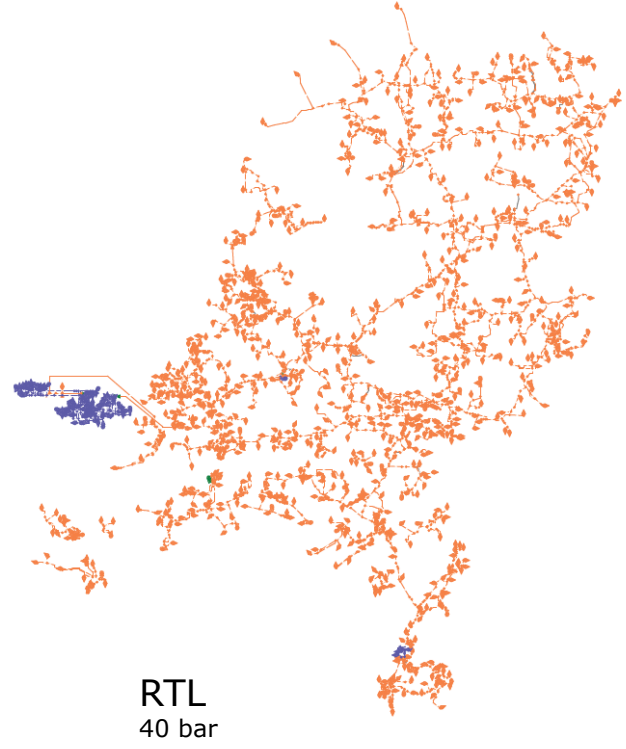


The GTS network



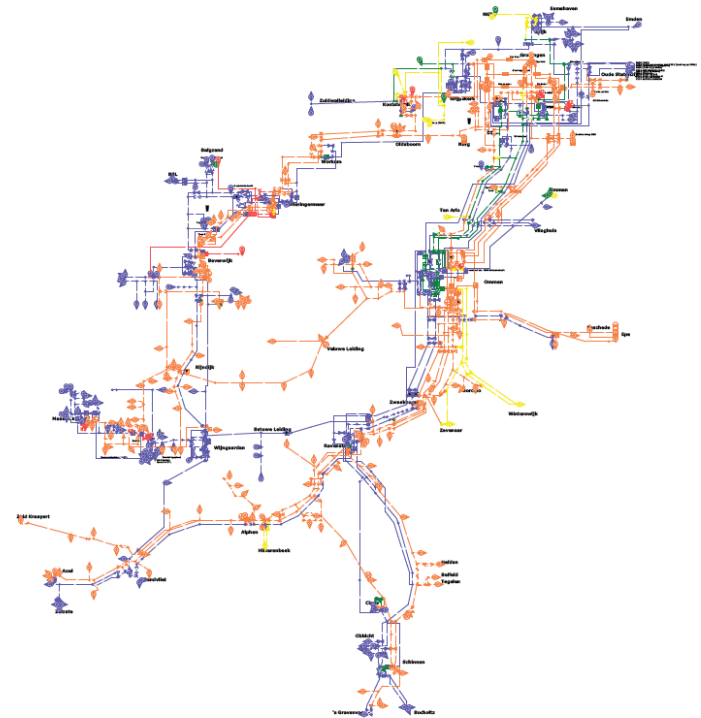
+

Connection
through M&Rs



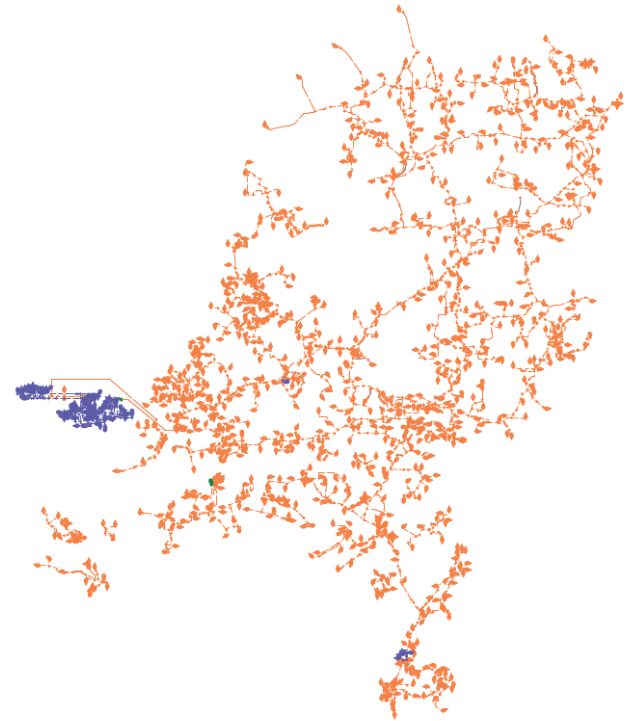
High pressure network (HTL)

- 80/67 to 40 bar
- 6000+ km pipelines
- 15 compressor stations
- 4 nitrogen blending stations
- Transit and domestic transport
- Connection to storage and LNG
- Various gas qualities
 - L-gas – local distribution
 - H-gas – industry and import/export
 - Technically ready for hydrogen and green gas transmission



Medium pressure network (RTL)

- 40 to 8 bar
- 6000+ km pipelines
- Transport to
 - direct customers
 - local distribution systems (households, commercials, smaller industry)
- 80+ connections with HTL (M&R stations)
- Mostly L-gas
 - two industrial H-gas regions (Botlek, Limburg)



The network of GTS is an entry/exit system

1. Entry into and exit from the system are independent
 - GTS has no control over supply
2. Balancing system for continuous operation
3. Entry & exit limited by contracts
 - Markets display specific behaviour (depending on season, circumstances)

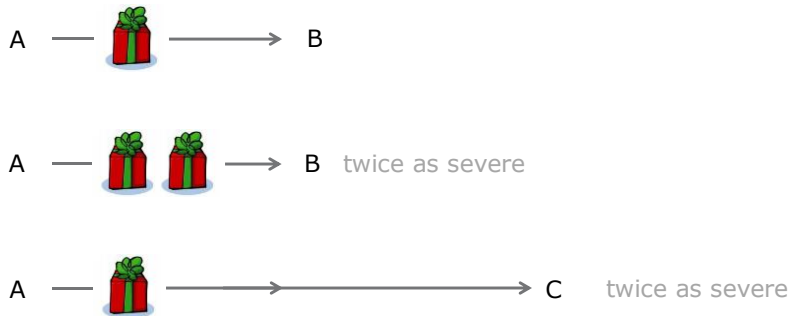


The Dutch highway system is an entry/exit system

- Challenge for GTS: “What can happen to us?”
 - What are the most severe transport situations that can occur realistically?
 - Find complete set of realistic, severe cases (“snapshots”)
 - Realistic: within contracts and in accordance with “market behaviour”
 - Severe: measured in terms of expected “transport load” based on flow and distance
- Entry & exit limited by technical conditions
 - Car drivers exhibit specific behaviour
 - Rush hour provides realistic, severe snapshots

Severe, realistic snapshots

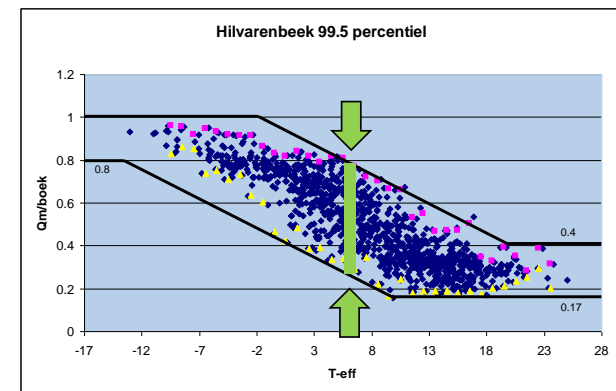
Severe = high transport load T



Severe cases have large $T = Q \times L$

- Q = total flow from entry to exit
- L = mean transport distance

Realistic =
within contractual/observed limits

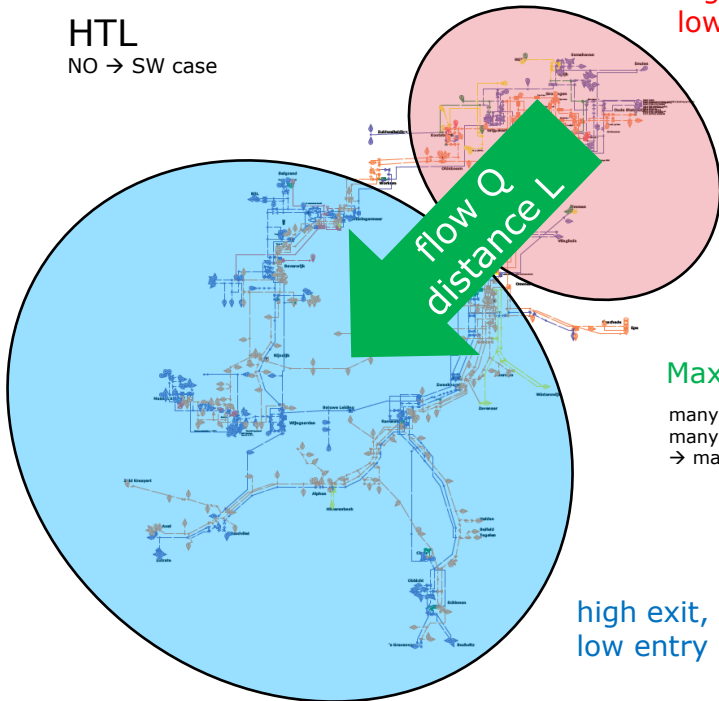


Each entry and exit between min/max limits

- Depending on contracts, temperature, season,...

Example snapshots

HTL
NO → SW case



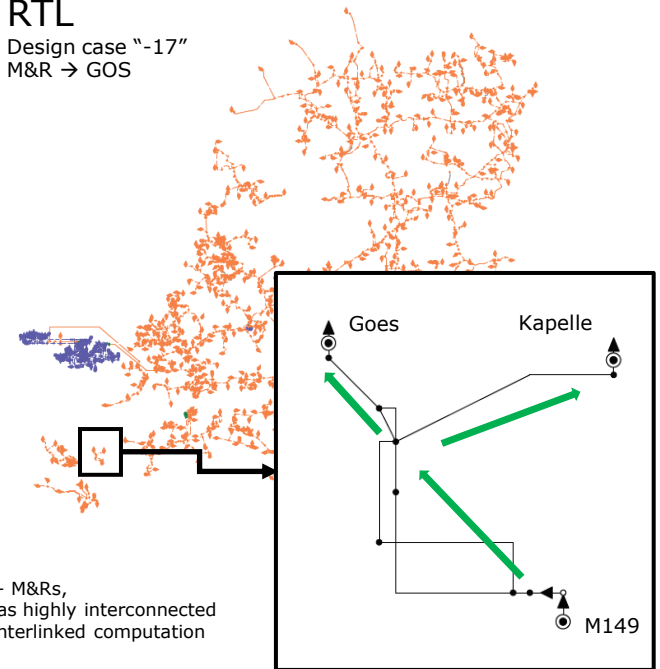
high entry,
low exit

Maximised Q.L

many directions,
many circumstances
→ many snapshots

high exit,
low entry

RTL
Design case "-17"
M&R → GOS

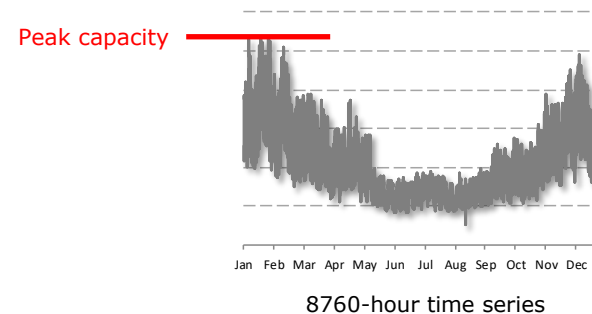


80+ M&Rs,
areas highly interconnected
→ interlinked computation

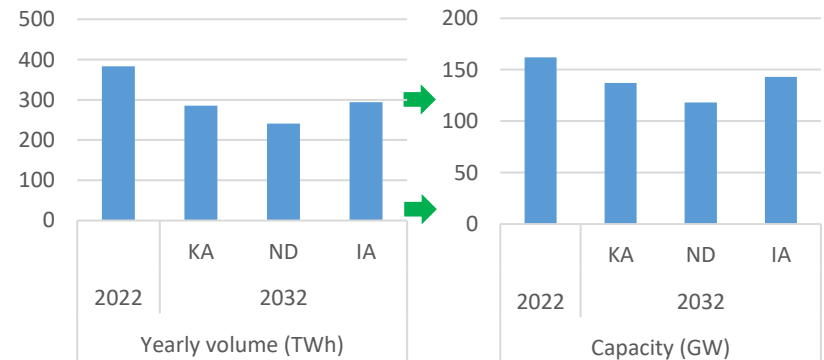
Capacity from volume scenarios

- Annual volume → hourly capacity
 - Convert to 8760-hour time series
 - Profile depends on temperature, wind, solar
 - Assumptions for market developments (historical data + trends)
 - Read peak demand from time series

- Capacity shows slower decrease than volume



Sector	Vol decrease	Cap decrease
Households	25% - 37%	17-29%
Industry	-5% - 29%	-8% - 25%
Power plants	46% - 50%	14% - 24%



IP2022 – Capacity analysis HTL

- Three volume scenarios for three reference years (2025, 2030, 3035)
 - KA – Climate agreement
 - ND – National Driver
 - IA – International Ambition
- Two reference years for capacity analysis
 - 2027, 2030 – full analysis of complete set of snapshots
- Around 200 extreme snapshots analysed for each reference year in each scenario
- No bottlenecks found
 - Flow re-routings in many cases, through standard component switches
 - High levels of nitrogen blending in majority of cases

IP2022 – Capacity analysis RTL

- Three volume scenarios
 - KA – Climate agreement
 - ND – National Driver
 - IA – International Ambition
- All scenario's show a decrease: current grid can do the job
- No bottlenecks found
 - Installation of green gas boosters to be studied separately in each individual case

IP 2022: Quality Methodology

Wim Borghols | Gasunie Transport Services



Replacement Investments

- Replacement Investments are done to:
 - Improve the condition or quality of the system
 - Relocate a part of the grid due to external reasons
- GTS applies 'risk-based Asset Management'
 - Measures are ranked according to risk-reduction per spend €
 - Risks are made financial (converted to €)
- Replacement Investments are done to solve 'quality bottlenecks' in the system
 - A 'quality bottleneck' is a situation in which the combination of the score on one or more of our business values (safety, security of transport, sustainability and acceptance of financial loss) with respect to severity and with respect of frequency is such that action is required
 - These analyses are performed using the GTS-risk matrix

GTS - risk matrix

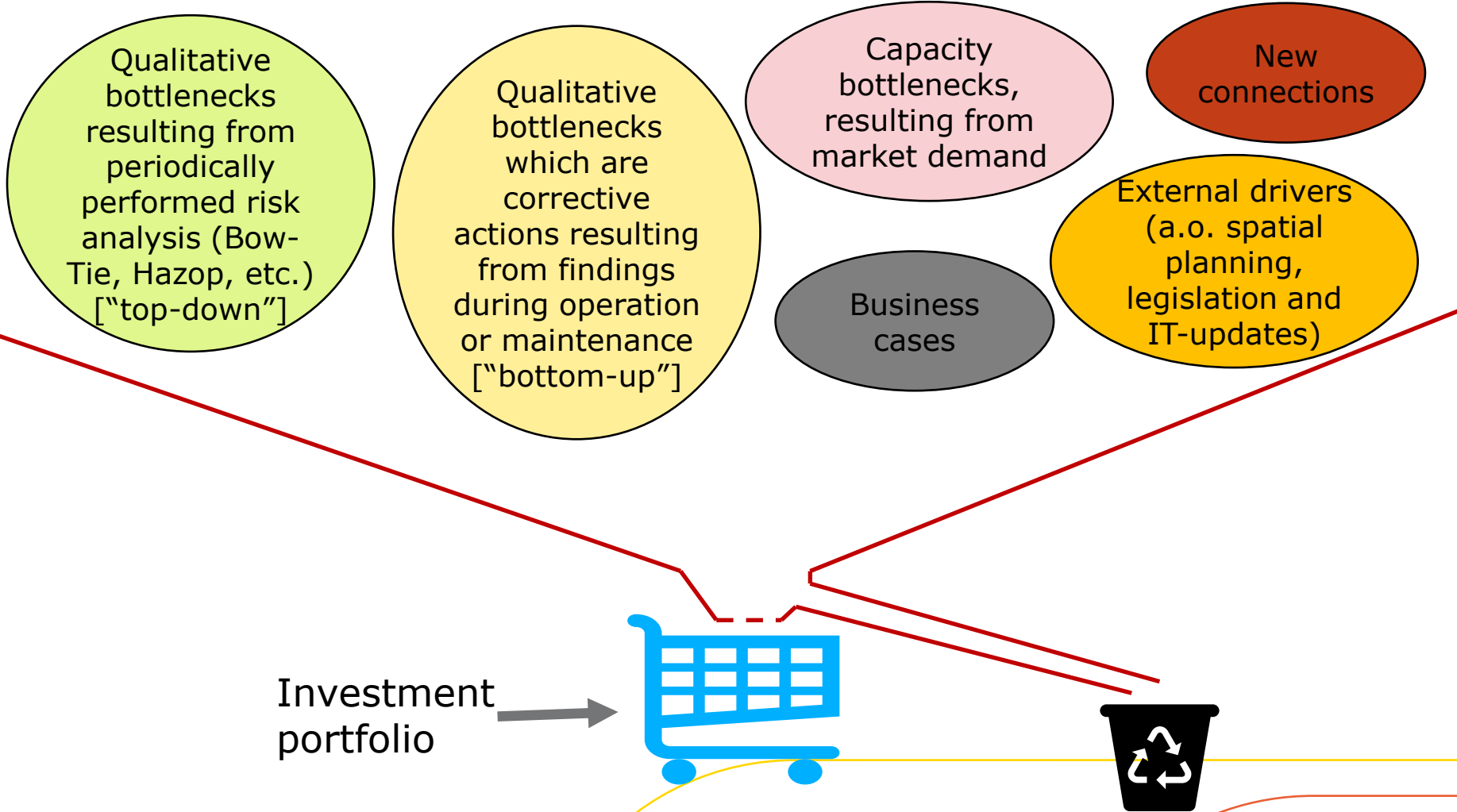
Acceptance of Financial Loss Sustainability Security of Transport Safety

Frequency (events/year) →

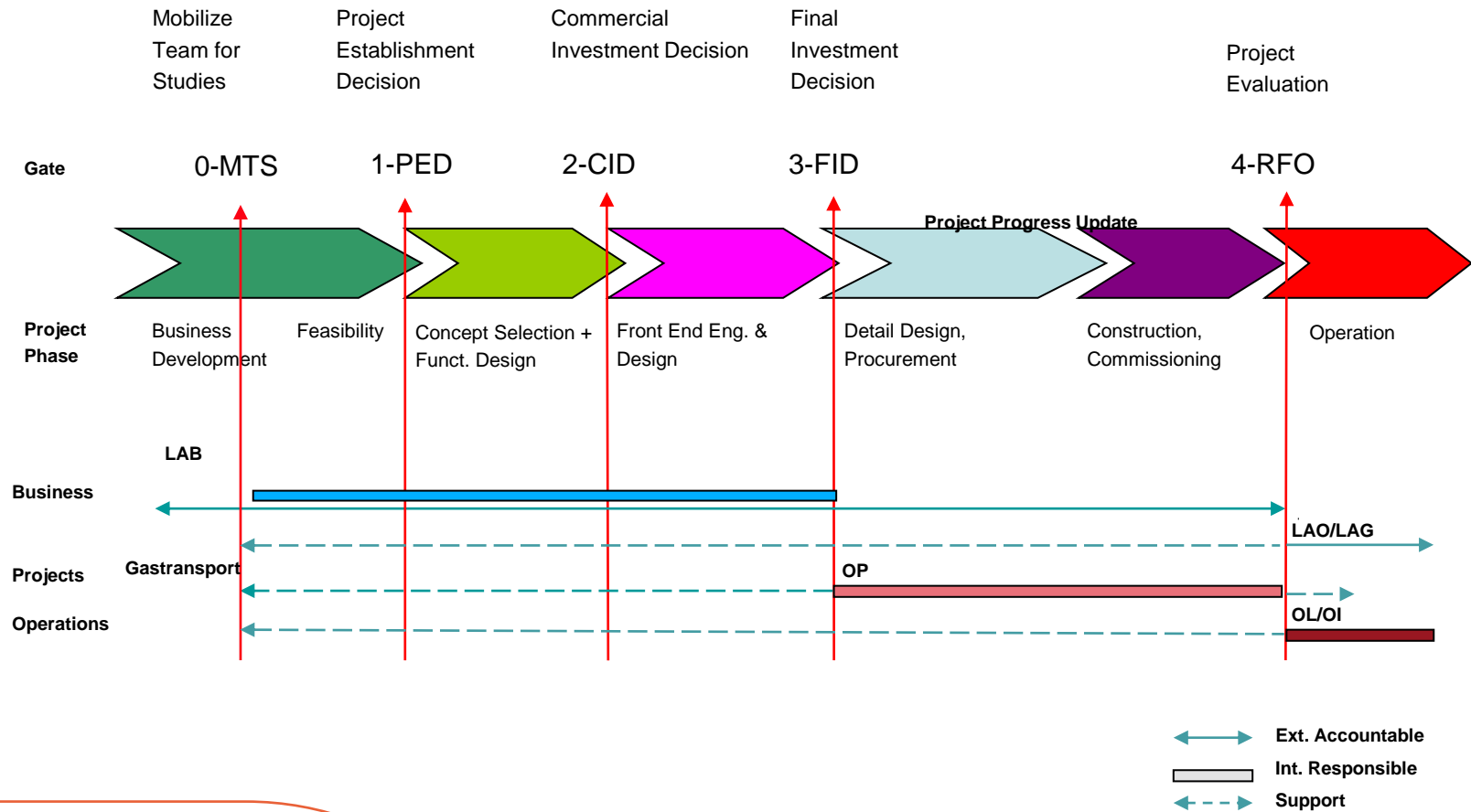
		Business Value BEDRIJFSWAARDE				frequentie van voorkomen				
		Schadebereidheid	Duurzaamheid	Transportzekerheid	Veiligheid	I	II	III	IV	V
		€	Ton CO2 eq	m3		0,0001-0,001	0,001-0,01	0,01-0,1	0,1-1	1-10 per jaar
ERNST GEVOLG	A	3k < S < 30k	100 < D < 1k	1k < T < 10k	gering letsel of gezondheidseffect (max EHBO)	0,0001	0,001	0,01	0,1	1
	B	30k < S < 300k	1k < D < 10k	10k < T < 100k	licht letsel of gezondheidseffect (RWC, MT)	0,001	0,01	0,1	1	10
	C	300k < S < 3M	10k < D < 100k	100k < T < 1M	ernstig letsel of gezondheidseffect (LTI)	0,01	0,1	1	10	100
	D	3M < S < 30M	100k < D < 1M	1M < T < 10M	blijvende invaliditeit tot 1 dodelijk slachtoffer	0,1	1	10	100	1000
	E	30M < S < 300M	1M < D < 10M	10M < T < 100M	meerdere dodelijke slachtoffers (1-10)	1	10	100	1000	10000

← Severity of consequence

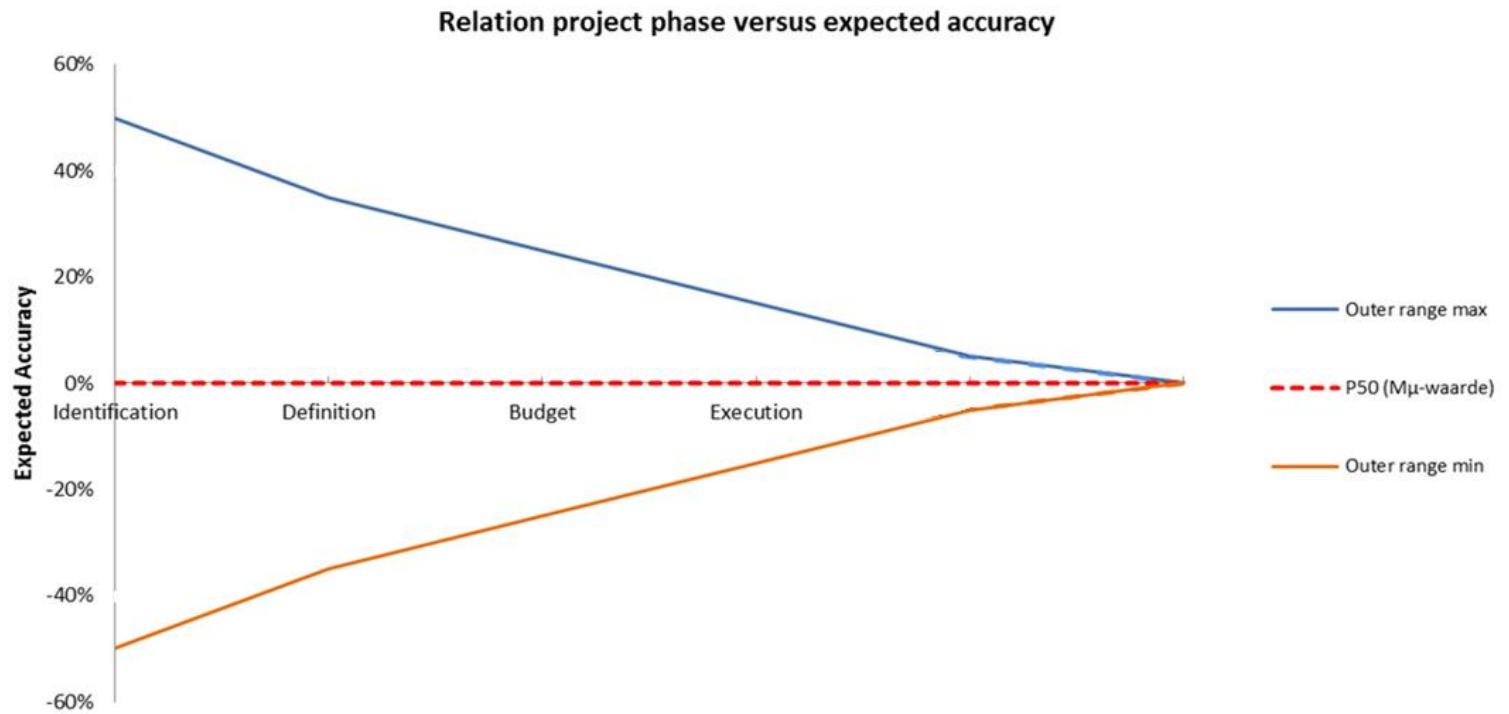
Origin of projects in the investment portfolio



Project Governance



Project budget methodology



Portfolio selection process

1. Possible projects are ranked according to risk-reduction per spend €
2. Additional aspects that are used to prioritise activities and projects:
 - a) Interference to the transport of Gas
 - b) People (capacity of the organisation and service providers)
 - c) Lead time for delivery of equipment
 - d) Permits (e.g. current environmental regulation on nitrogen deposit)
 - e) Synergy with other activities (cost, safety)
 - f) Financial aspects (total budget available)
 - g) Influence on maintenance
 - h) Energy transition

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IP 2022: investment portfolio 2022, 2023 and further years

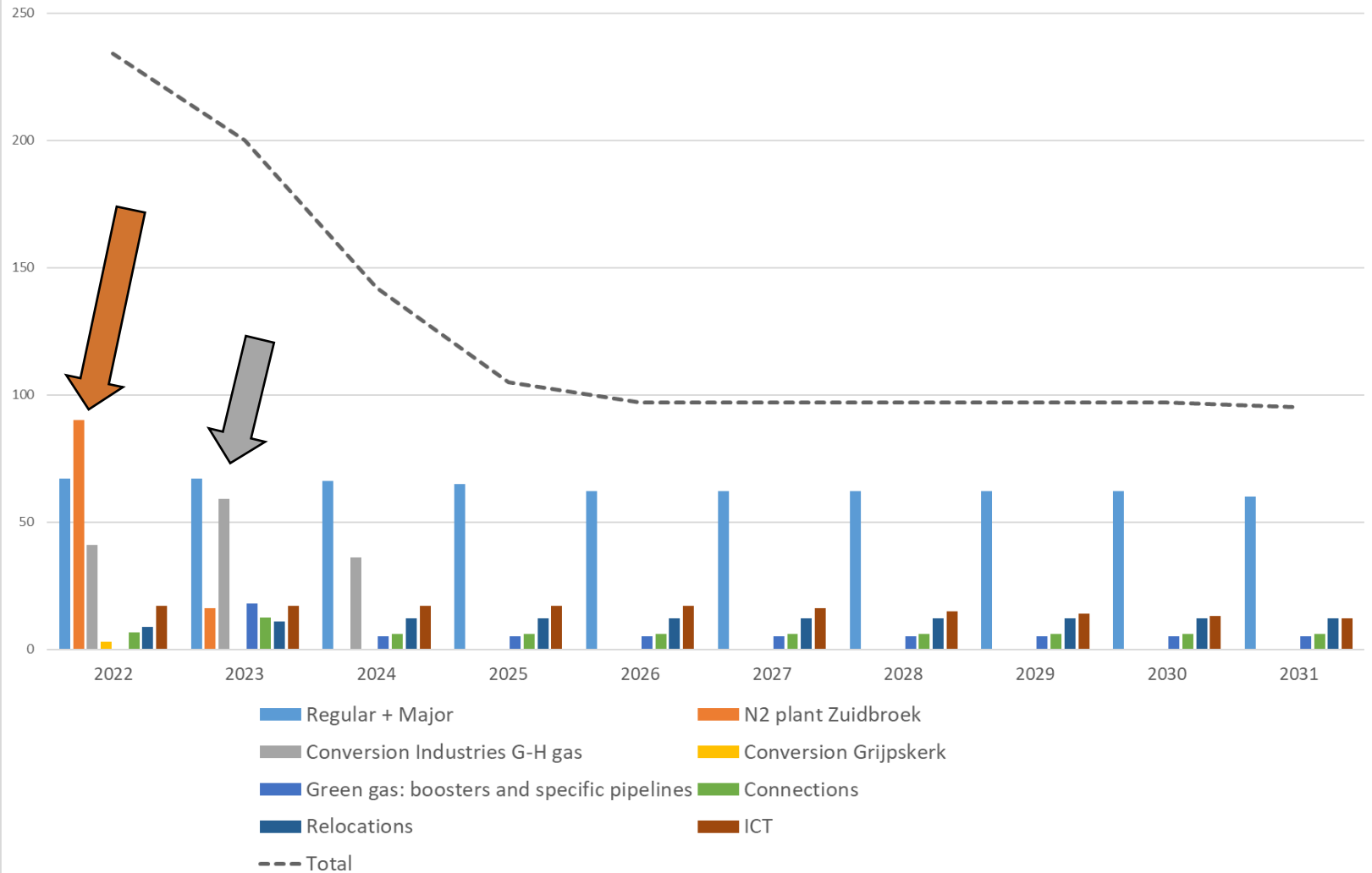
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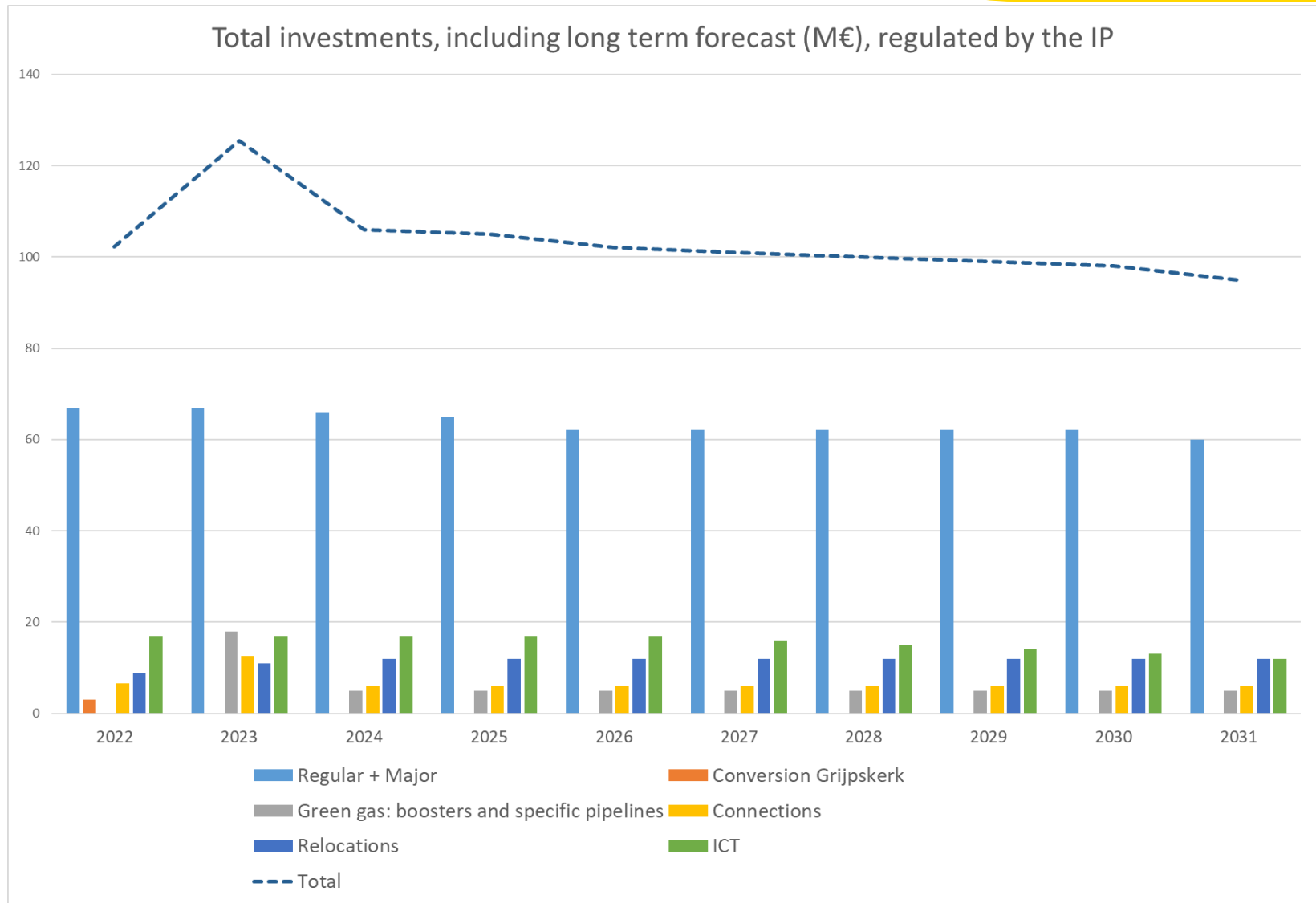


Process of establishing the portfolio for replacement (and extension) investments

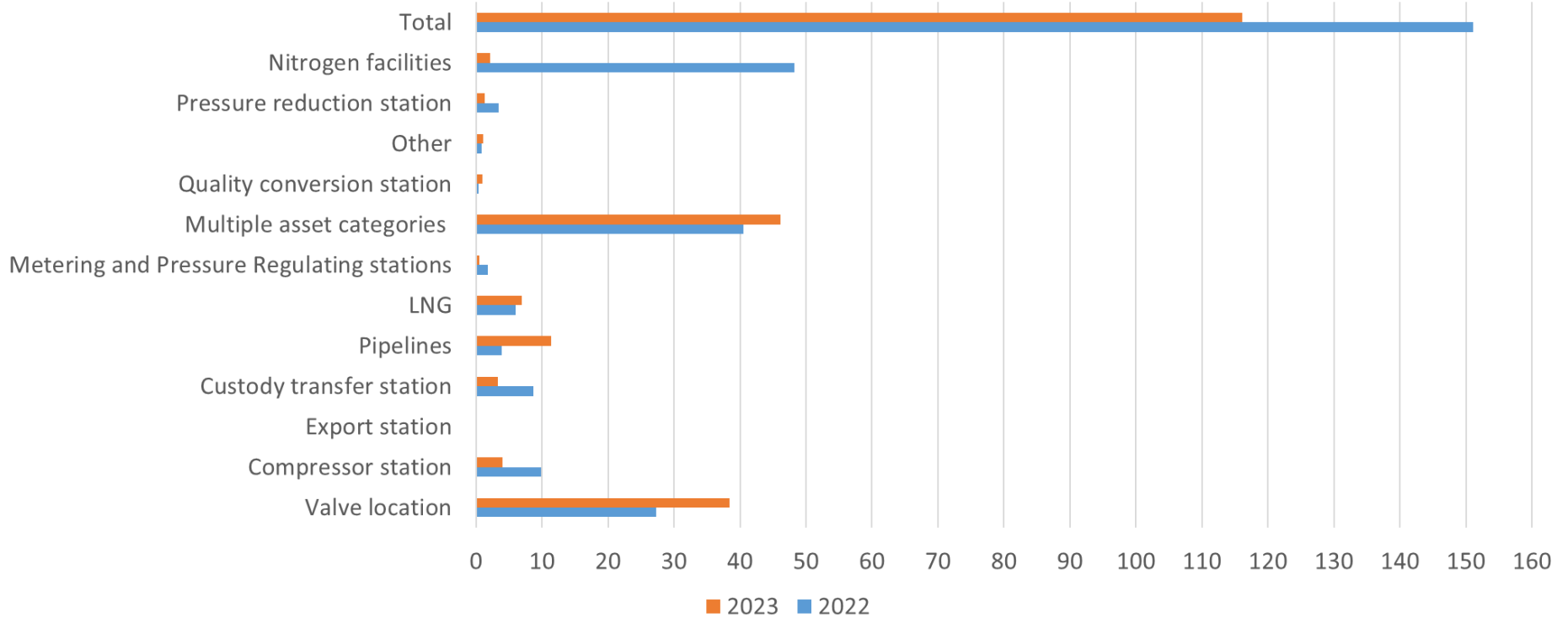
- The current process uses a horizon of 1 year, i.e. the investment portfolio for 2022 is determined in the summer of 2021
- The numbers given are determined as follows:
 - 2022: 80% FID passed, remainder will pass in Q3/Q4
 - 2023: indicative
 - 2024-2031: Best estimate
- The numbers are semi-final (final numbers will be given in IP)
- Please note: investment terms for IT-investments are very short

Total investments, including long term forecast (M€)



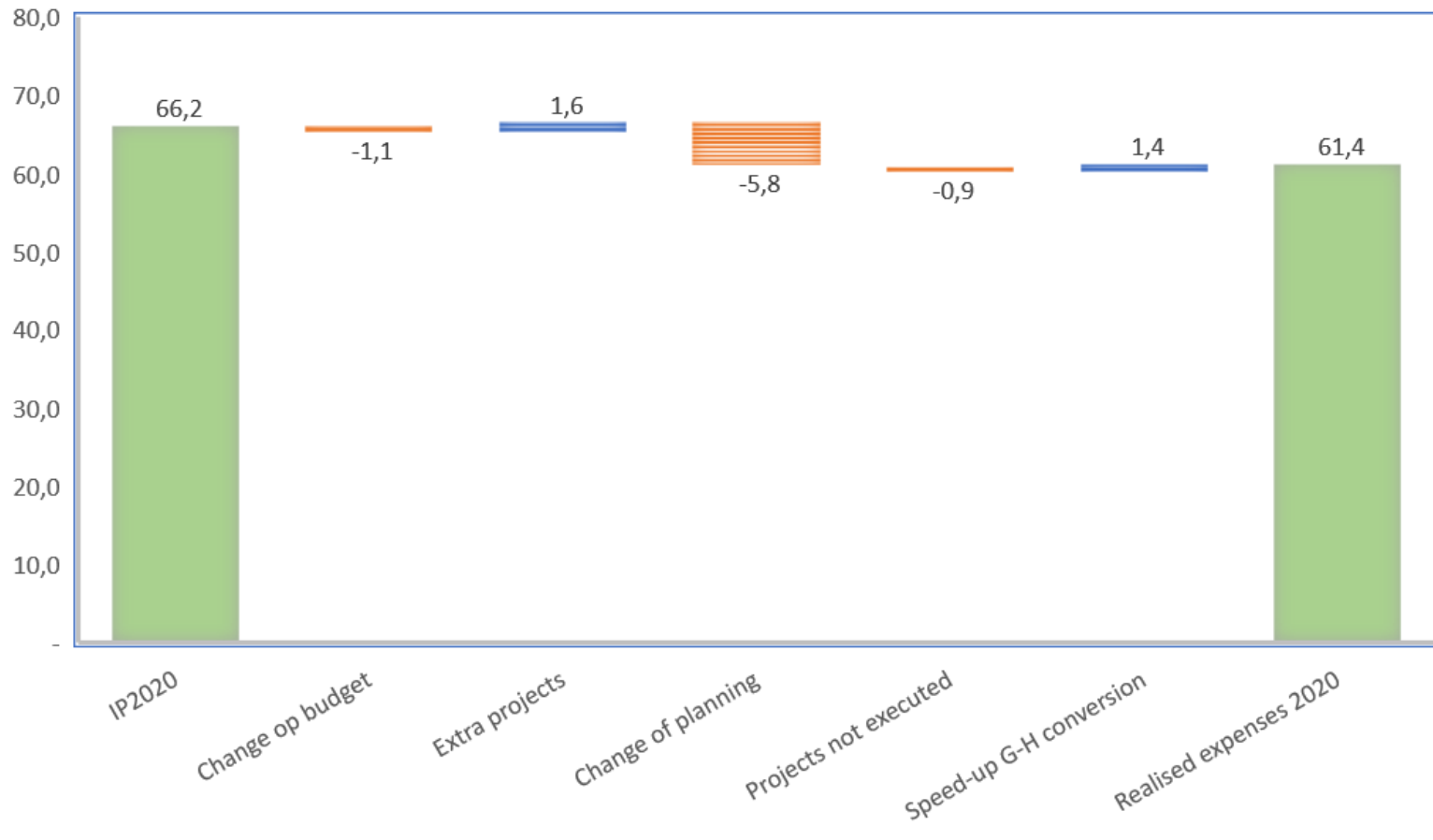


Regular and Major Investments (M€)



2020 RETROSPECT

■ Increase ■ Decrease ■ Total



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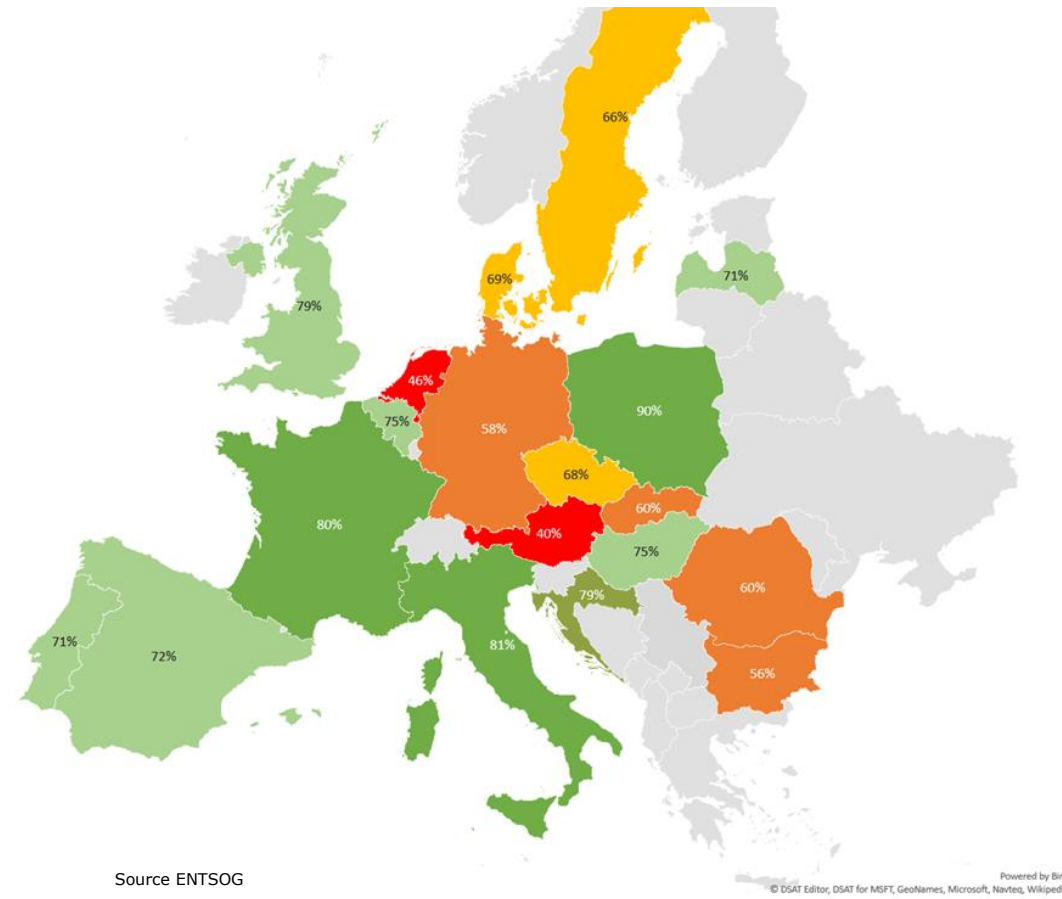
IP 2022: Development in the Dutch gas market

Stock level underground storages

Anne Spijkstra | Gasunie Transport Services



Situation per 1 September 2021



Storage stock level in The Netherlands

- Situation on 9 september 2021

Storage	Gas quality	Type UGS	% Filled	Max (bcm)
EnergyStock	G-gas	Daily	81%	0,4
UGS Norg	G-gas	Seasonal	73%	6,0
PGI Alkmaar	G-gas	Seasonal	97%	0,5
UGS Bergermeer	H-gas	Seasonal	22%	4,8
UGS Grijpskerk	H-gas	Seasonal	38%	2,7

- Source: <https://agsi.gie.eu/#/>

Role GTS

- Dutch Gas Act: It is the task of GTS to operate, maintain and develop its gas transport network under economic conditions in a way that guarantees the safety, efficiency and reliability of that gas transport network and of the transport of gas and protects the environment.
- There is sufficient infrastructure now, and in the future (see our investment plan)
- GTS is not responsible for gas supply (except for peak task for households)

Role Shippers

- Shippers are responsible for balancing their respective portfolio(s)
- Therefore, the responsibility for ensuring sufficient gas for the supply to Dutch customers rests on the shippers on the Dutch gas market.
- As this gas (for the most part) cannot be supplied anymore by the Groningen field, it is even more important that (all) market parties take responsibility.
- Dutch balancing system will trigger automatically WDM buy actions in short situations
- In case of low UGS stock level and gas shortage, the SBS might stay in the red zone because the offered volume for WDM buying actions might not be sufficient anymore.

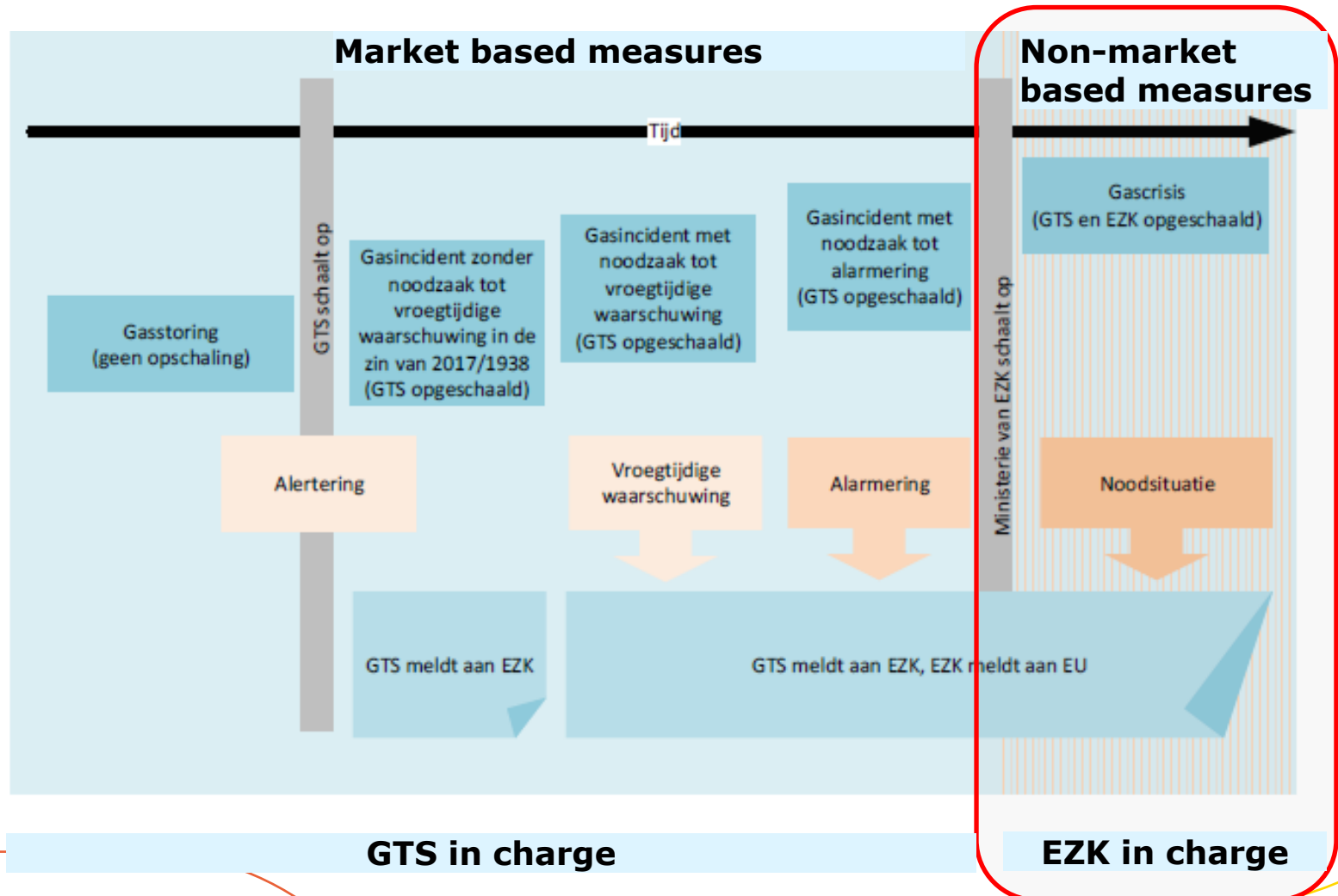
GTS can declare emergency situation

- Dutch Transportcode article 4.1.4.1.
“If this forecast is in the red zone and the grid operator of the national gas transportation grid expects that the implementation of the WDM transaction will have insufficient effect, the grid operator of the national gas transportation grid can declare an emergency and act as described in 4.1.4.4.”
- According to 4.1.4.4 GTS can take (one of) the following measures:
 - suspending the process that initiates the WDM transactions as described in 4.1.4.1;
 - deployment of any contracted resources for emergencies;
 - instructions regarding installations for the storage of gas or LNG and at entry points of the national gas transport network;
 - instructions at exit points of the national gas transport network.
- If it is not sure that these measures will be successful or sufficient, then in parallel, we will inform the Ministry of EZK on “activating” the Dutch Emergency Plan, the so-called “bescherm- en herstelplan”.

Gas crisis: non-market based measures

- “In a situation where there is an exceptionally high gas demand, a significant disruption of the gas supply or any other significant deterioration in the gas supply situation, and all relevant market-based measures have been applied but the gas supply is not sufficient to meet to meet the remaining gas demand and therefore additionally also non-market-based measures must be taken, the Director-General Climate & Energy (DG K&E) announces in his capacity as Crisis Manager Gas and Electricity (CGE) a gas crisis/emergency situation and informs the European Commission thereof”
- Laid down in Dutch “Bescher- en herstelplan gas”
- <https://www.rijksoverheid.nl/documenten/publicaties/2019/10/04/bescher- en-herstelplan-gas>
- Based on Regulation (EU) nr. 2017/1938 concerning measures to safeguard the security of gas supply

Gas crisis: non-market based measures



Gas crisis: non-market based measures

	Sequence of measures¹	Type of measure	Targeted on which type of gas user²
1	Calls for a reduction in natural gas consumption	Social	All natural gas users
2	2a Request to neighboring countries for a voluntary reduction of natural gas consumption (government to government) 2b Request to EC for declaring regional gas crisis	International	Non-protected natural gas users
3	Invoke results of tender "less gas usage"	Economic	Non-protected natural gas users
4	Impose of an additional levy on natural gas	Economic	Non-protected natural gas users
5	Forced fuel switching of industries	Legal	Non-protected natural gas users
6	Forced fuel switching for electricity production	Legal	Non-protected natural gas users
7	Switch off not protected natural gas users (administrative and/or technical)	Legal / technical	Non-protected natural gas users
8	Switch off natural gas users not protected by solidarity (administrative and/or technical)	Legal / technical	Protected natural gas users, but not protected by solidarity
9	Invoke mutual solidarity between EU member states	International	Foreign natural gas users not protected by solidarity
10	Switch off natural gas users protected by solidarity	Legal	Natural gas users protected by solidarity
11	Switch of regional areas including export	Technical	Natural gas users protected by solidarity

¹ See chapter 8.5 of "bescherm- en herstelplan"

² See chapter 4.9 of "bescherm- en herstelplan"

Concluding remarks

- There is sufficient infrastructure in place
- Market parties in the Netherlands are responsible for balancing their portfolio and supplying their customers
- Groningen field is currently fully volume and capacity regulated (market based measure) and is not a “strategic reserve” (i.e. not available as non market base measure)
- Low UGS Stock level show that potential gas shortage is not a hypothetical case
- Emergency situations not hypothetical
- Process, procedures and responsibilities are in place in case of emergency situations
- But we all want to prevent an emergency situation
- **QUESTION:** Are additional measures necessary?