

FUTURE SCENARIOS TOWARDS 2050

Port of Rotterdam has developed possible global scenarios to explore ways forward and prepare for uncertainties ahead in a rapidly changing world.



**ECONOMICS
& GEOPOLITICS**

**ENVIRONMENT
& SOCIETY**

**TECHNOLOGY
& SUPPLY CHAINS**

EXTERNAL DRIVERS (VARIABLE)

Geopolitical stability

Government policy

Consumer behaviour

Global climate change measures

Circular economy

Corporate Social Responsibility

True cost of production

True cost of transport

GLOBAL SCENARIOS 2050



**CONNECTED
DEEP GREEN**



**REGIONAL
WELL-BEING**



**PROTECTIVE
MARKETS**



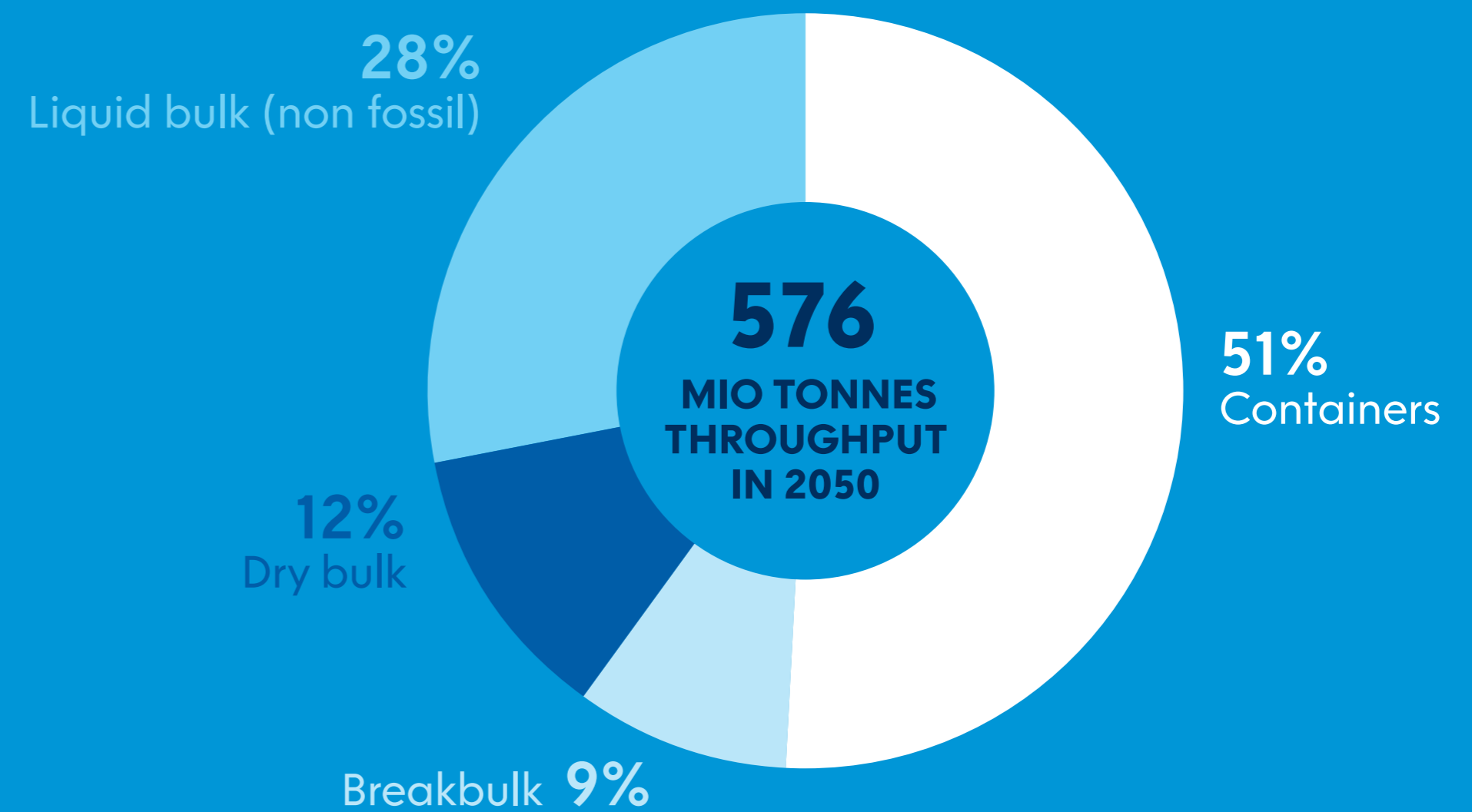
**WAKE-UP
CALL**

CONNECTED DEEP-GREEN



Core narrative of this global scenario

Effective global cooperation with acceleration on digital transparency in logistics chains and global commitment to targets to combat climate change, resulting in global carbon neutrality by 2050, broad prosperity and high economic growth and a maximum temperature rise of 1.5 degrees Celsius this century.



Impact on port and industrial complex

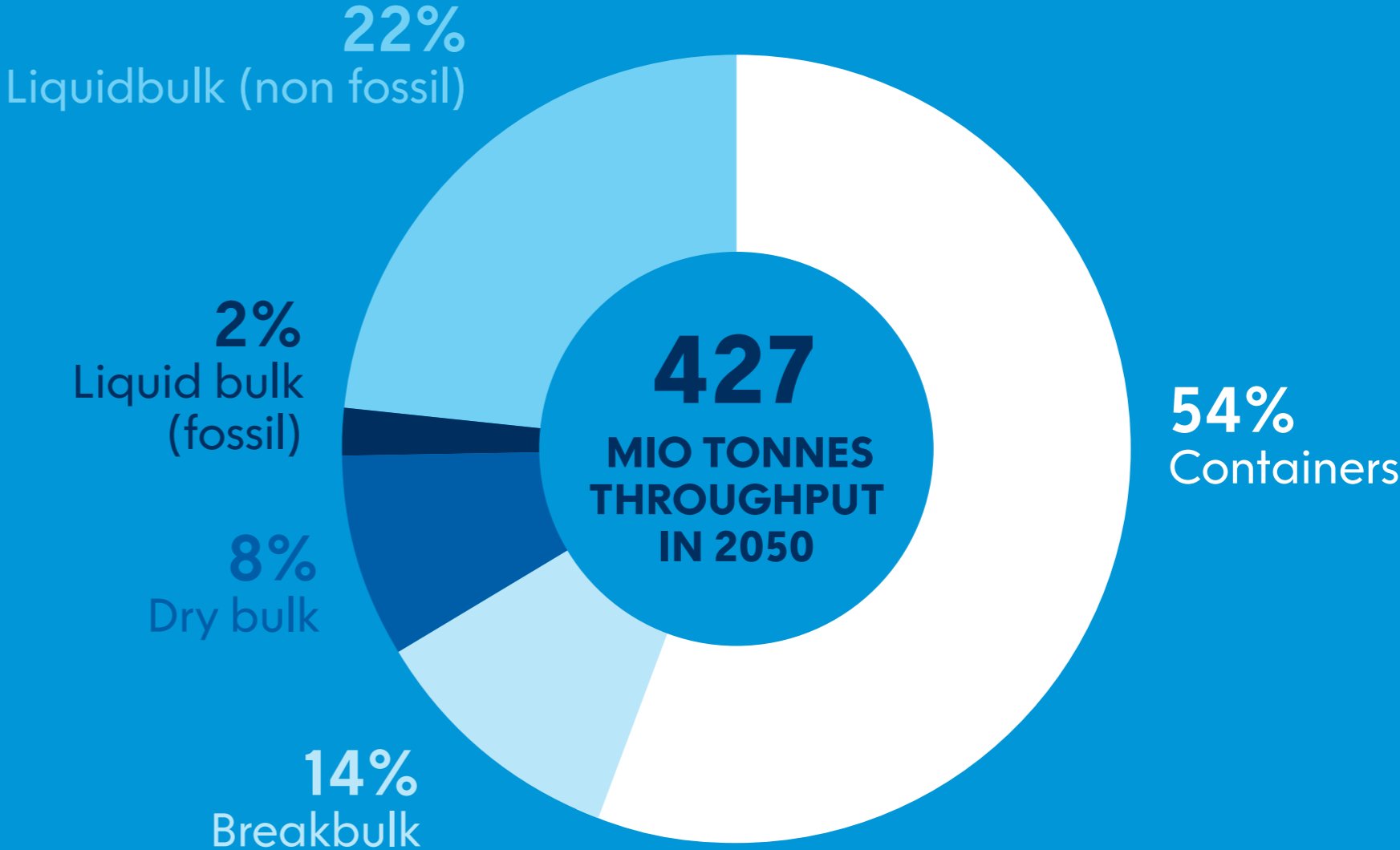
Institutional quality and geopolitical stability are high due to global cooperation. High investments to achieve carbon neutrality in 2050, in combination with high population projections, result in a strong GDP. Growing world trade leads to considerably more container handling. Large amounts of renewable energy, fossil energy falls to zero in 2050.

REGIONAL WELL-BEING



Core narrative of this global scenario

From a shared commitment to transition, in the absence of sufficient global trust, a tilt towards a regional focus on clean and healthy environments, privacy and well-being emerges within clusters of countries by early 2030. This results in a deteriorating business environment for basic industry in Northwestern Europe and moderate economic growth.



Impact on port and industrial complex

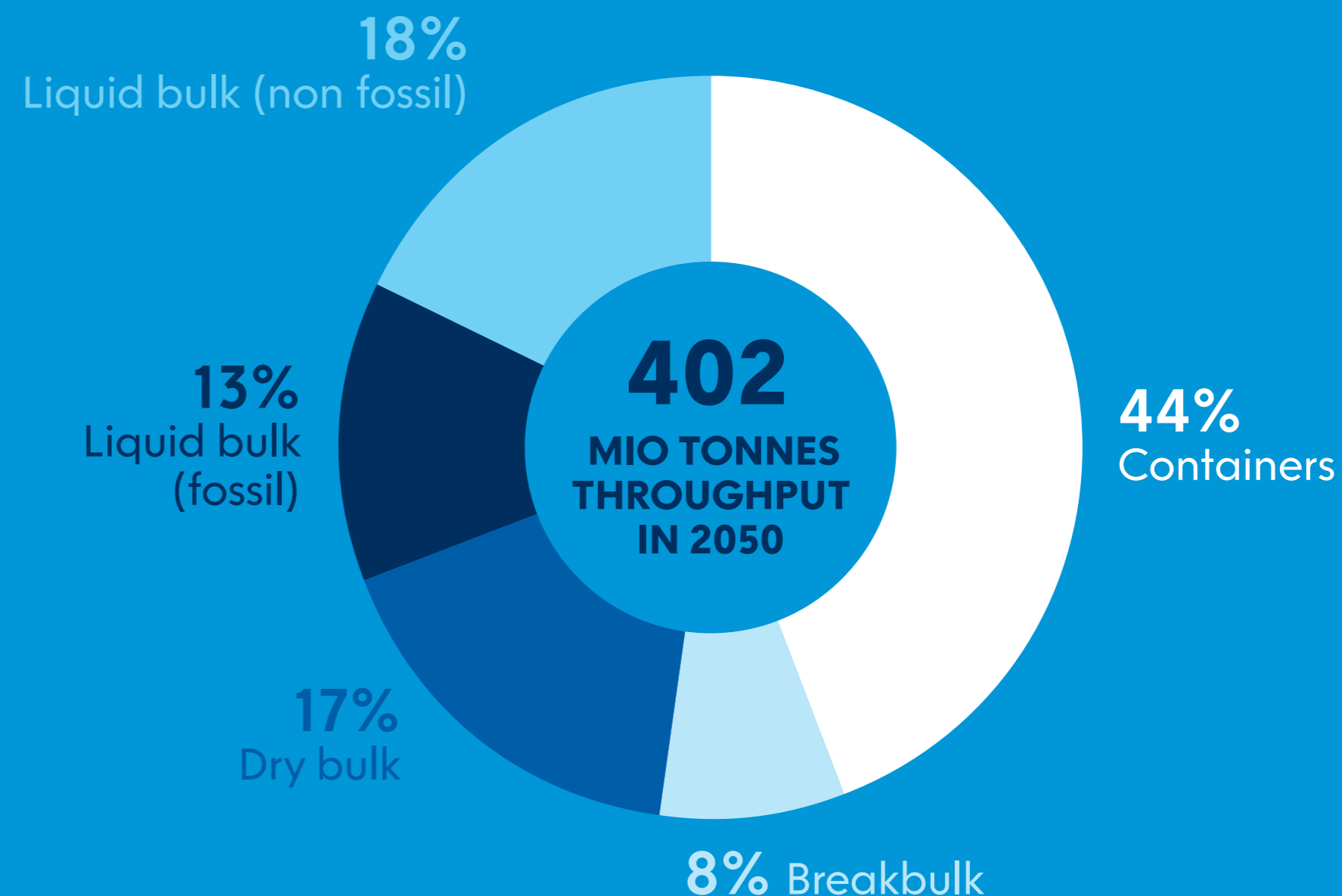
Moderate growth of world economy due to trade barriers and deviating CO₂ measures between countries. Business climate for energy-intensive industry in Northwest Europe is affected by growing attention to quality of living environment. Strong decrease in total throughput, especially crude oil, coal, iron ore. More breakbulk due to import of semi-finished products. Strong intra-regional European market with growth in shortsea volumes.

PROTECTIVE MARKETS



Core narrative of this global scenario

A world with distrust between power blocks, global geopolitical tensions and suboptimal integration in logistics chains. There are competing economic interests in a fragmented world with a focus on self-sufficiency, financial prosperity, resilience and defence. No global carbon neutrality before 2100 and low economic growth.



Impact on port and industrial complex

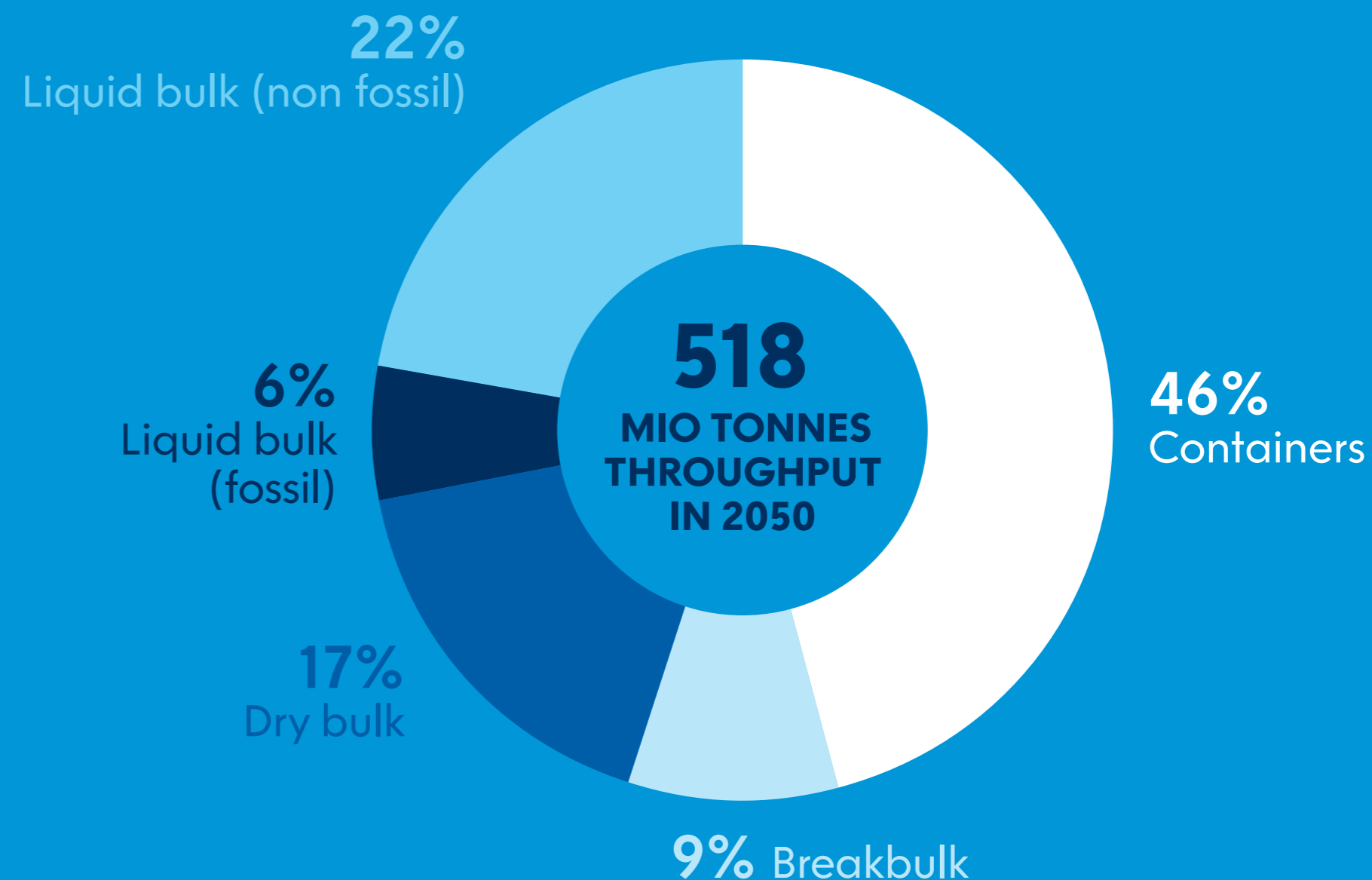
Neglect of climate obligations has a negative effect on investments. Extreme weather conditions and less R&D reduce productivity. Declining EU population size, low economic growth, significant reduction in throughput volume. Slow substitution to renewable energy due to trade barriers. Considerably less crude oil refining, less general cargo due to re- and nearshoring.

WAKE-UP CALL



Core narrative of this global scenario

Increasing concerns about the economic impact of external shocks such as food and energy availability or extreme weather mark a turning point. There is growing awareness that strategic cooperation and rigorous measures are needed to reduce carbon emissions. This results in strategically strong EU policies, moderate economic growth and late but rapid transition to renewable energy.



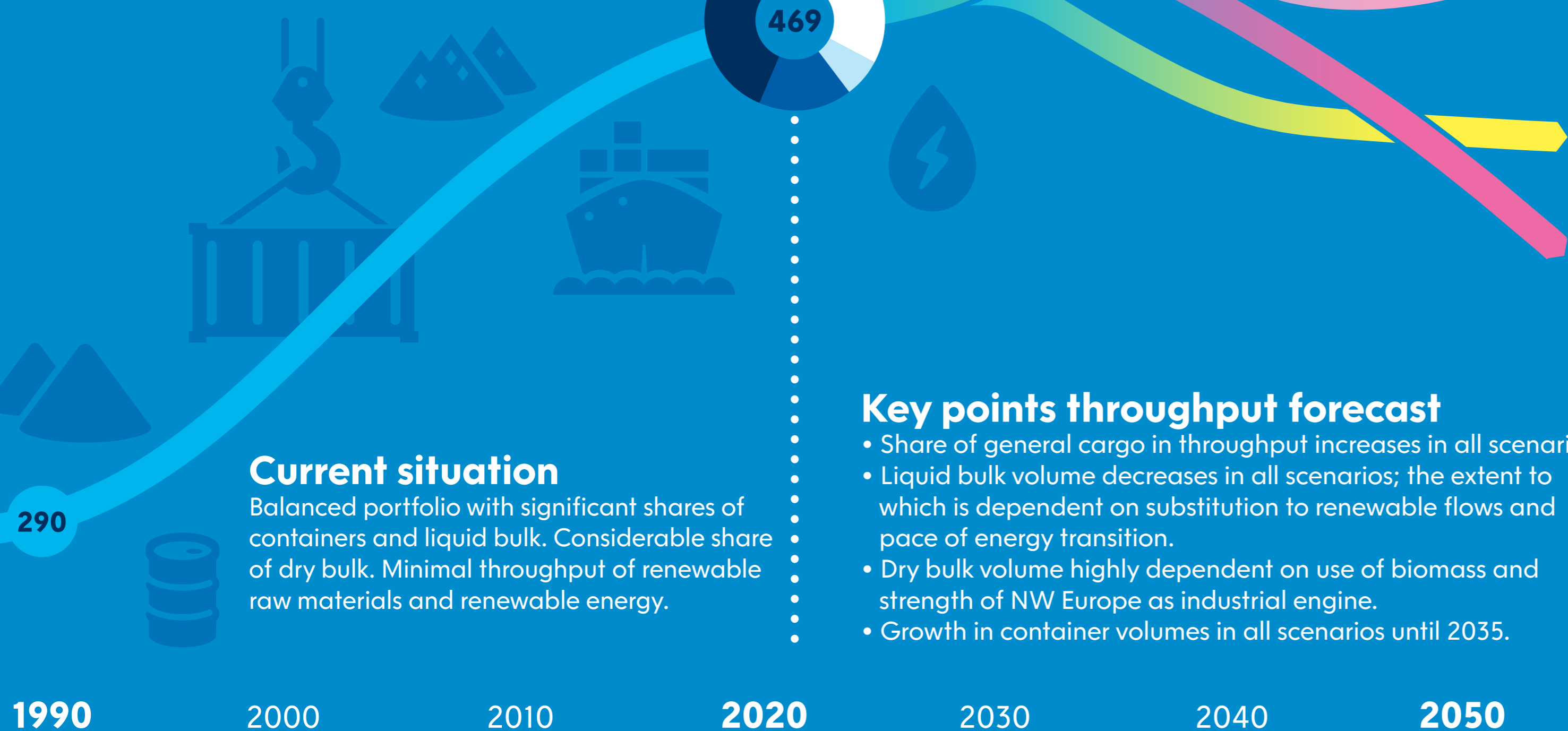
Impact on port and industrial complex

Increase in investments and economic growth due to radical accelerations in sustainable energy from 2030. Slight decrease in EU population, shift in consumer behaviour and belief. More imports of biomass as a raw material for energy and chemistry. Late but fast energy transition requires CO₂ storage. Increase in containers due to favorable economic climate. Considerably more throughput of non-fossil fuels.

THROUGHPUT PER SCENARIO TOWARDS 2050

IN MILLIONS OF TONNES

The Port of Rotterdam has developed four global scenarios, each resulting in a distinctive forecast of the throughput development towards 2050.



Current situation

Balanced portfolio with significant shares of containers and liquid bulk. Considerable share of dry bulk. Minimal throughput of renewable raw materials and renewable energy.

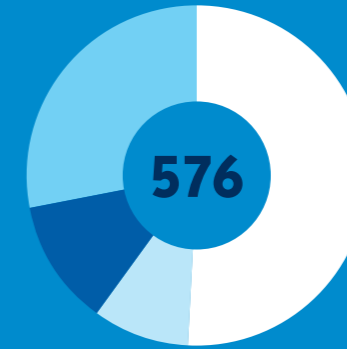
2021

469

Key points throughput forecast

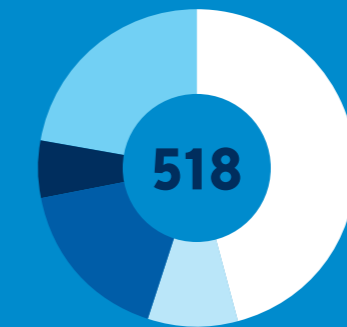
- Share of general cargo in throughput increases in all scenarios.
- Liquid bulk volume decreases in all scenarios; the extent to which is dependent on substitution to renewable flows and pace of energy transition.
- Dry bulk volume highly dependent on use of biomass and strength of NW Europe as industrial engine.
- Growth in container volumes in all scenarios until 2035.

CONNECTED DEEP GREEN



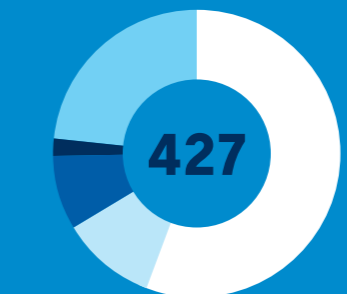
Fossil energy falls to zero in 2050; instead large amounts of renewable energy (e.g. H₂, NH₃). Strong increase in containers due to growing global trade.

WAKE-UP CALL



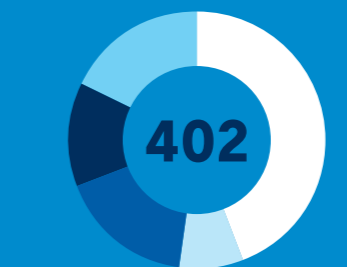
More biomass imports as feedstock for energy and chemicals. Late but rapid energy transition requires CO₂ storage. Increase in containers due to favourable economic climate.

REGIONAL WELL-BEING



Strong decline in crude oil, coal, iron ore due to contactation of energy-intensive industries. As a result, more general cargo volume due to imported semi-finished products.

PROTECTIVE MARKETS



Trade barriers lead to delayed substitution to renewable energy. Considerably less crude oil refining. Less general cargo due to reshoring and nearshoring.

LEGEND

- Containers
- Breakbulk
- Dry bulk
- Liquid bulk (fossil)
- Liquid bulk (non-fossil)

1990

2000

2010

2020

2030

2040

2050