Climate and transition – risks, models and resilience

WEF

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About Baringa | We are a global management consultancy with a deep focus on energy and transition, supported by leading energy market, system and climate analytics

WHO WE ARE

- Our purpose is to create **impact that lasts** for our clients, the environment, and the communities where we live and work
- Recognised market leaders with 150+ partners with 2,000+ market and sector experts across **Europe, North America, Asia and Australia**

FT FINANCIAL TIMES statista — UK'S LEADING MANAGEMENT CONSULTANTS 2025

WORLD'S BEST MANAGEMENT CONSULTING FIRMS — Forbes 2024 — POWERED BY STATISTA

- Deep sector expertise and client relationships including in:
  - **Agriculture**
  - **Financial Services**
  - **Energy Systems**
  - **Industry**
  - **Government**
  - **Climate Finance**
  - **Circularity**
  - **Water**
  - **Social Impact**
  - **Startup Ecosystems**

WHAT WE DO

- **Develop Growth Strategies**
- **Drive Commercial Excellence**
- **Optimize Portfolio Returns**
- **Advise Transactions and M&As**
- **Deliver Sustainability and ESG**

WHERE WE WORK

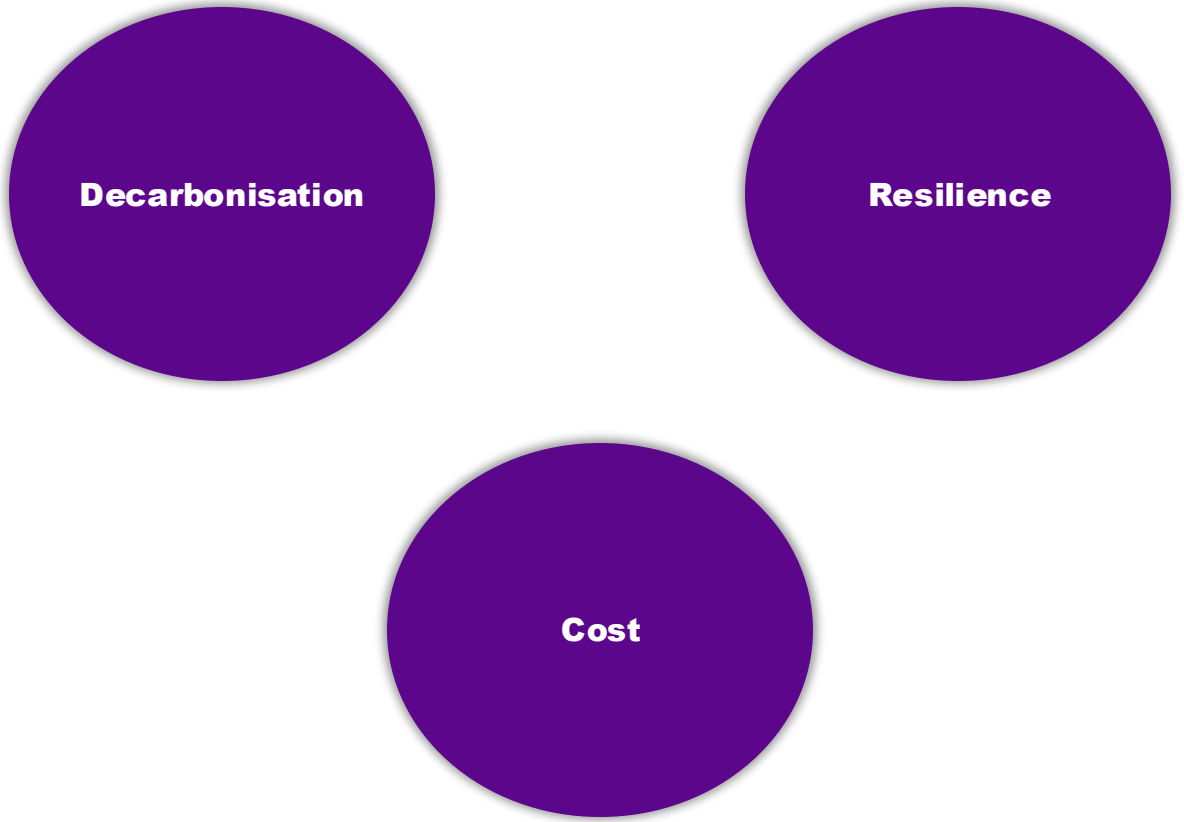
ADB Asian Development Bank · BainCapital · Barclays · BlackRock · Bridges Fund Management · Blackstone · Brookfield · Carlyle · HSBC · European Bank for Reconstruction and Development · EQT · Goldman Sachs Asset Management · Gresham House · LDC · NatWest Group · LGIM · KKR · Fortescue The New Force in Iron Ore · AngloAmerican · Rio Tinto · noble · Trafigura · equinor · Department for Energy Security & Net Zero · TotalEnergies · Shell · bp · Petronas · Glencore · Vattenfall · EDF Energy · Tata Steel · enel · Hydrogen Council

NESO National Energy System Operator · nationalgrid · SGN · SP Energy Networks · Scottish & Southern Electricity Networks · Northern Powergrid · UK Power Networks · ena energynetworks association · electricity north west · Cadent Your Gas Network · national gas · Wales & West Utilities · Northern Gas Networks

Example clients and partners.

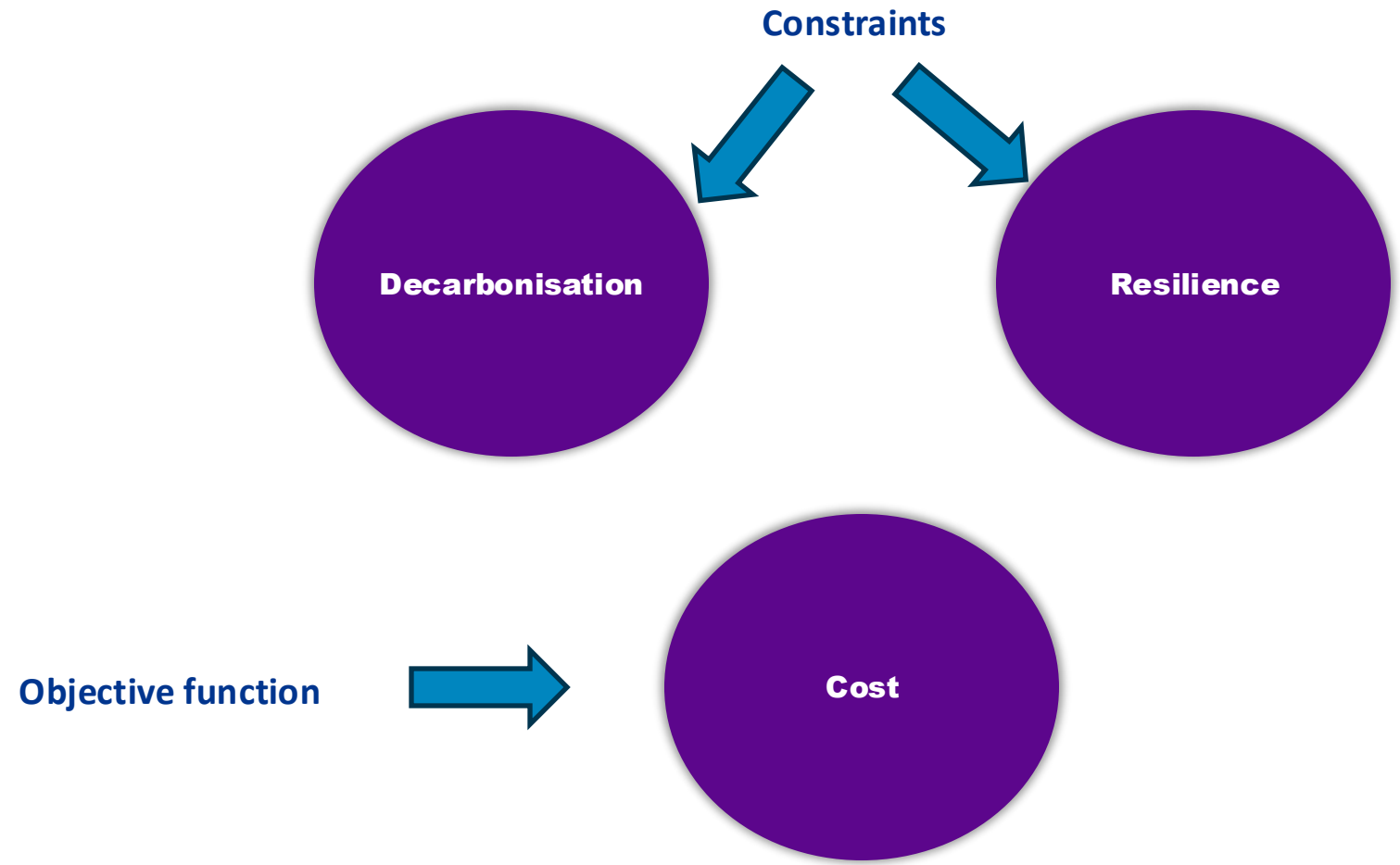
Baringa

Setting the frame | The challenge



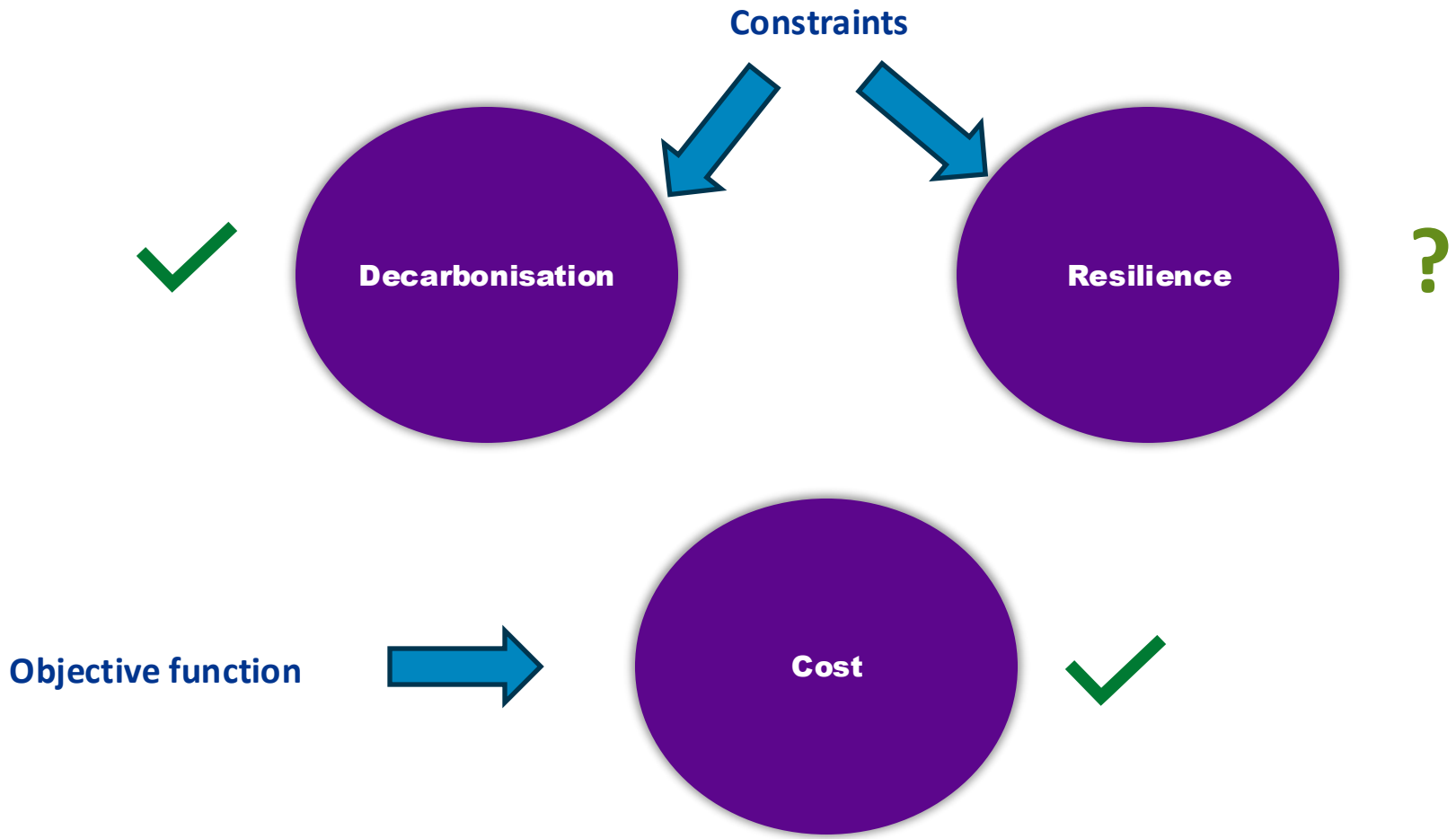
Trilemma?

Setting the frame | The challenge



Or optimisation problem?

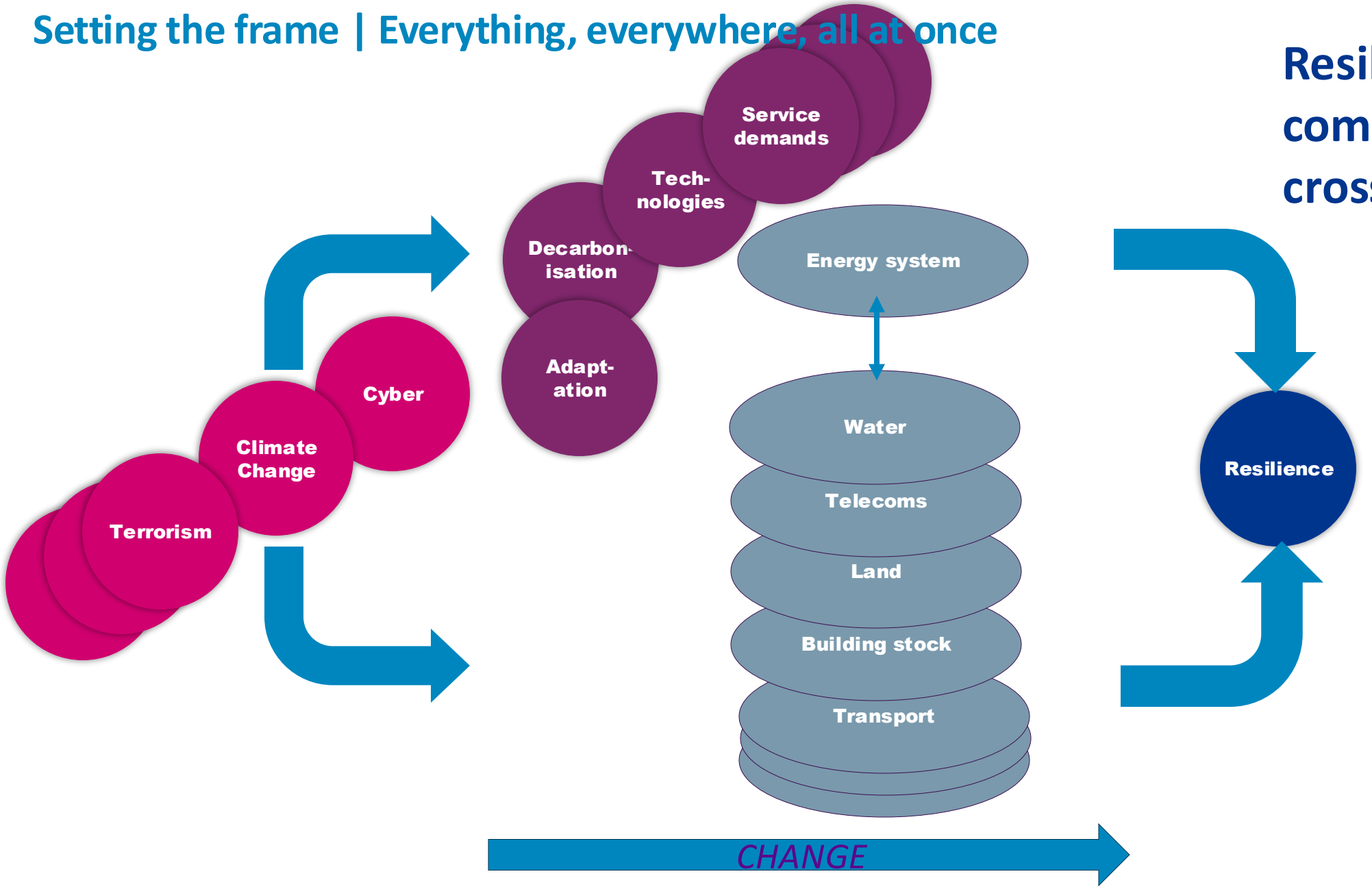
Setting the frame | The challenge



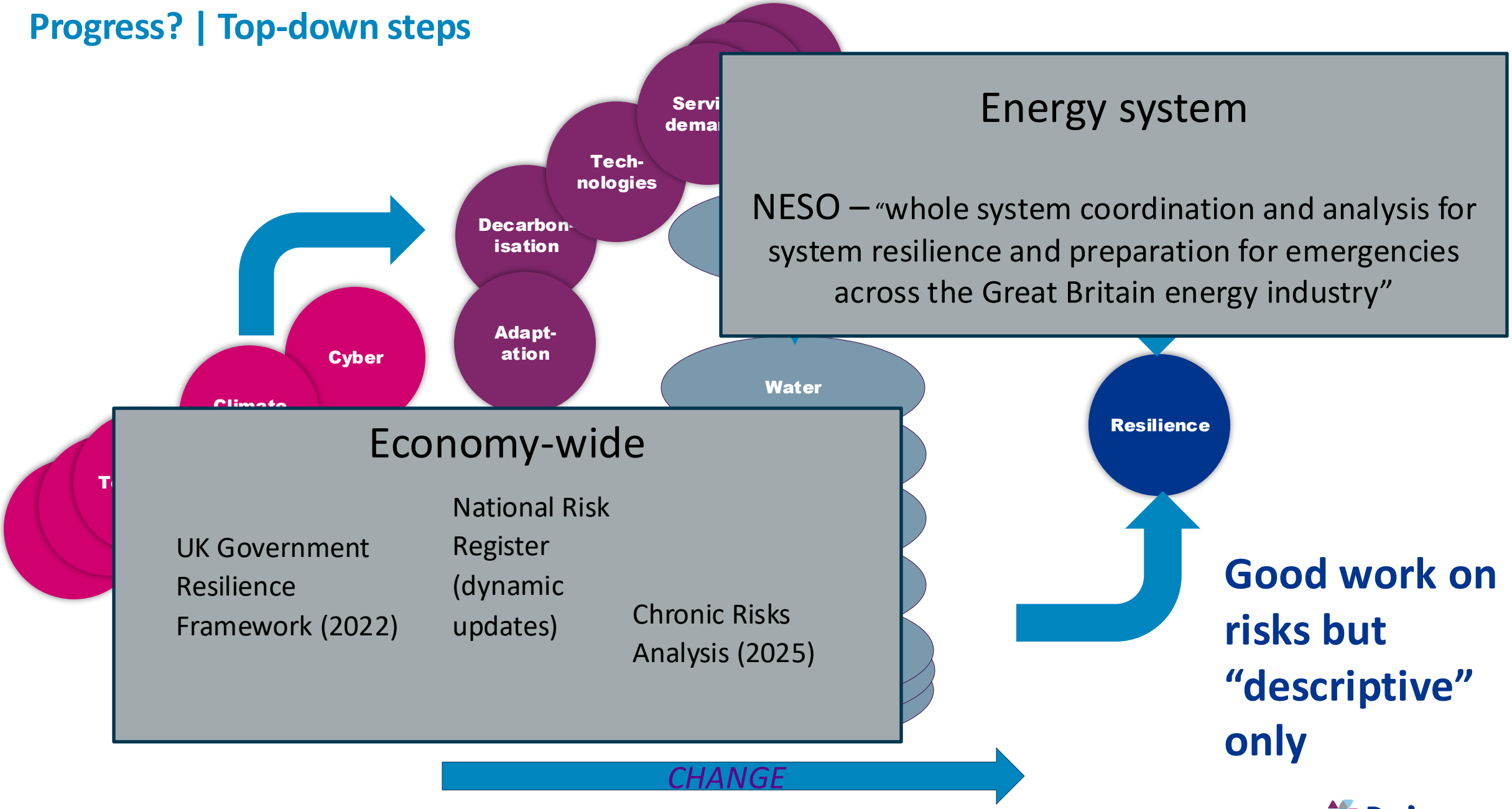
What can we measure?

Setting the frame | Everything, everywhere, all at once

Resilience is complex and cross-cutting



Progress? | Top-down steps



Good work on risks but "descriptive" only

Baringa Report | The purpose of our report was to build on past studies to consider the holistic resilience of the UK energy system as it transitions through to 2050

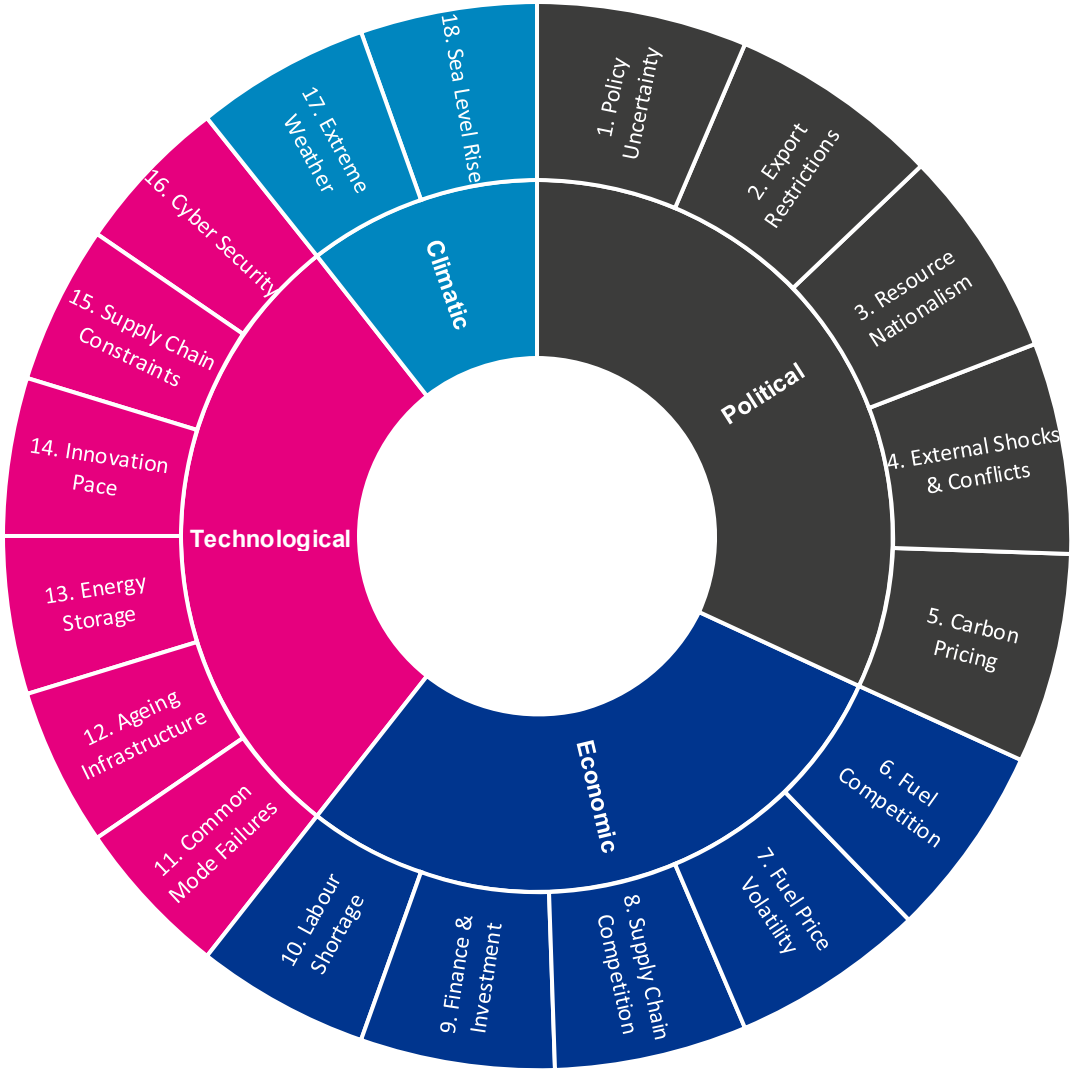
"The National Preparedness Commission (NPC) is an independent and non-political body, whose fundamental objective is to promote policies and actions to help the UK be significantly better prepared to avoid, mitigate, respond to, and recover from major shocks, threats and challenges."

- We took four scope parameters:
  - **Fuels** (Oil & Refined Products, Natural Gas, Bioenergy, and Hydrogen)
  - **Power** (Renewables, Storage, Nuclear, and Networks)
  - **Resilience Categories** (Political, Economic, Technology, Climatic)
  - **Enablers** (Labour & Skills, Cyber, Infrastructure)

- Three key questions:
  1. Where are the **indicative risks** facing respective parts of the **UK energy system to 2050**?
  2. What is the **interaction between these risks** that could further reduce energy resilience?
  3. How can the UK develop a **system-wide energy resilience evaluation framework** to ensure **cost effective investment to enhance system security**?

https://nationalpreparednesscommission.uk/publications/assessing-energy-system-resilience-in-the-uk-to-2050/

Resilience Methodology | Resilience was defined as the "ability to withstand or quickly recover from a difficult situation, but also get ahead of those risks … before they manifest"

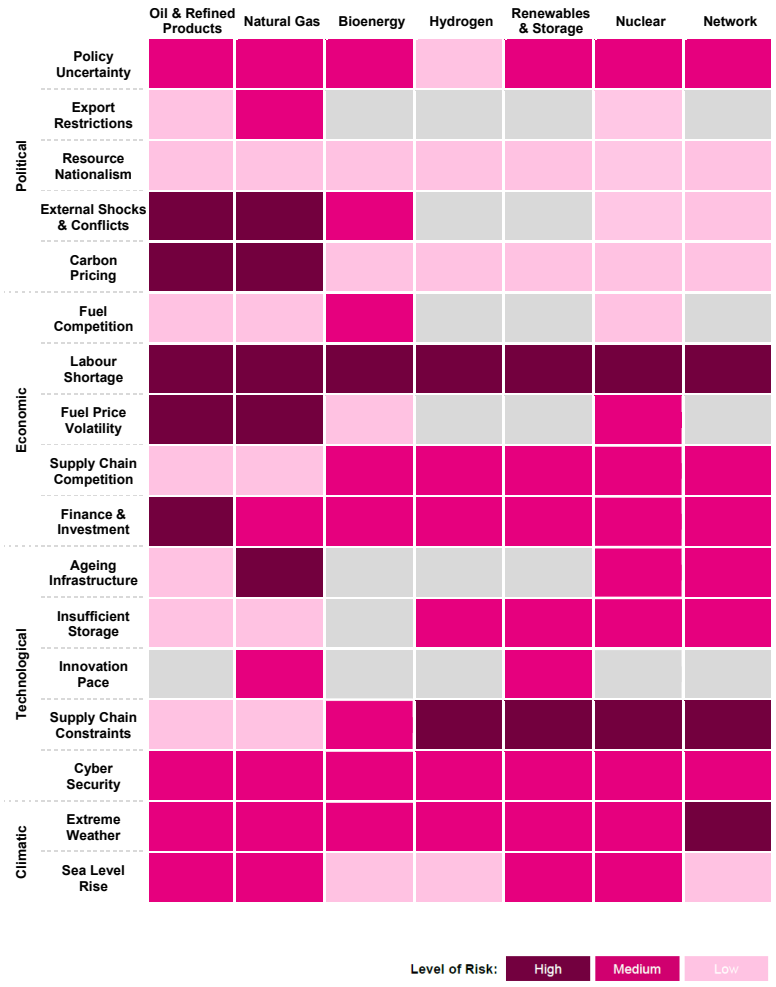


- Definition built on the UK Gov's looking at 18 risk themes across the four resilience areas (Political, Economic, Technology and Climate)

- The ideal system encompassed six key characteristics:

1. **Reflective** – evaluating its own supply and demand dynamics
2. **Predictive** – identifying future impacts
3. **Flexible** – adapting efficiently to shifting conditions in real time
4. **Integrated** – coordinating seamlessly between different systems
5. **Redundant** – accommodating sufficient spare capacity
6. **Inclusive** – engaging a wide array of stakeholders

Key Insights | The UK energy system is fast-transitioning and needs an integrated framework that can inform investment decisions on resilience from a holistic perspective



1. Whilst the UK energy system is evolving both in the overall energy demand and the make-up of that supply, no individual system will be fully redundant
   - Practically, that means **we will need to support a wider footprint of infrastructure with a shifting consumer base and constantly evolving risk profile** (e.g. support legacy gas networks with lower population of gas consumers)

2. Multiple risks are cross cutting including labour, supply chain shortages, and extreme weather (e.g. at least 245 power stations and 809 substations at risk of surface or river flooding)
   - We need a **joined-up approach to how we consider integrated or cascading risks** especially **where there are dependencies or competition on resources or solutions**

Recommendations | We need a framework to support decision-making

Despite the good work, we still can't answer some basic questions:

i. **How resilient is the system today?**

ii. **How is resilience changing?**

iii. **How resilient do we want it to be?**

The UK needs to establish a common framework for assessing energy system resilience, and can take learnings from the financial system – and other sectors - to develop:

i. **A more sophisticated way of assessing impact, integrating both price and loss of supply** (applicable across all systems)

ii. **A standardised approach for all system actors**

iii. **A common set of stress tests to align scenario and risk testing**

iv. **Co-ordinated application across sectors, with potential for "war-gaming"**

Thank you!