

CReDo+

Climate Resilience Demonstrator → Climate Resilience Decision Optimiser
Show and Tell – Alpha Phase – 22.04.24

Innovation Manager (UK Power Networks)
Senior Product Manager (Connected Places Catapult)
Tech Lead (Connected Places Catapult)





INFRASTRUCTURE INTERDEPENDENCIES

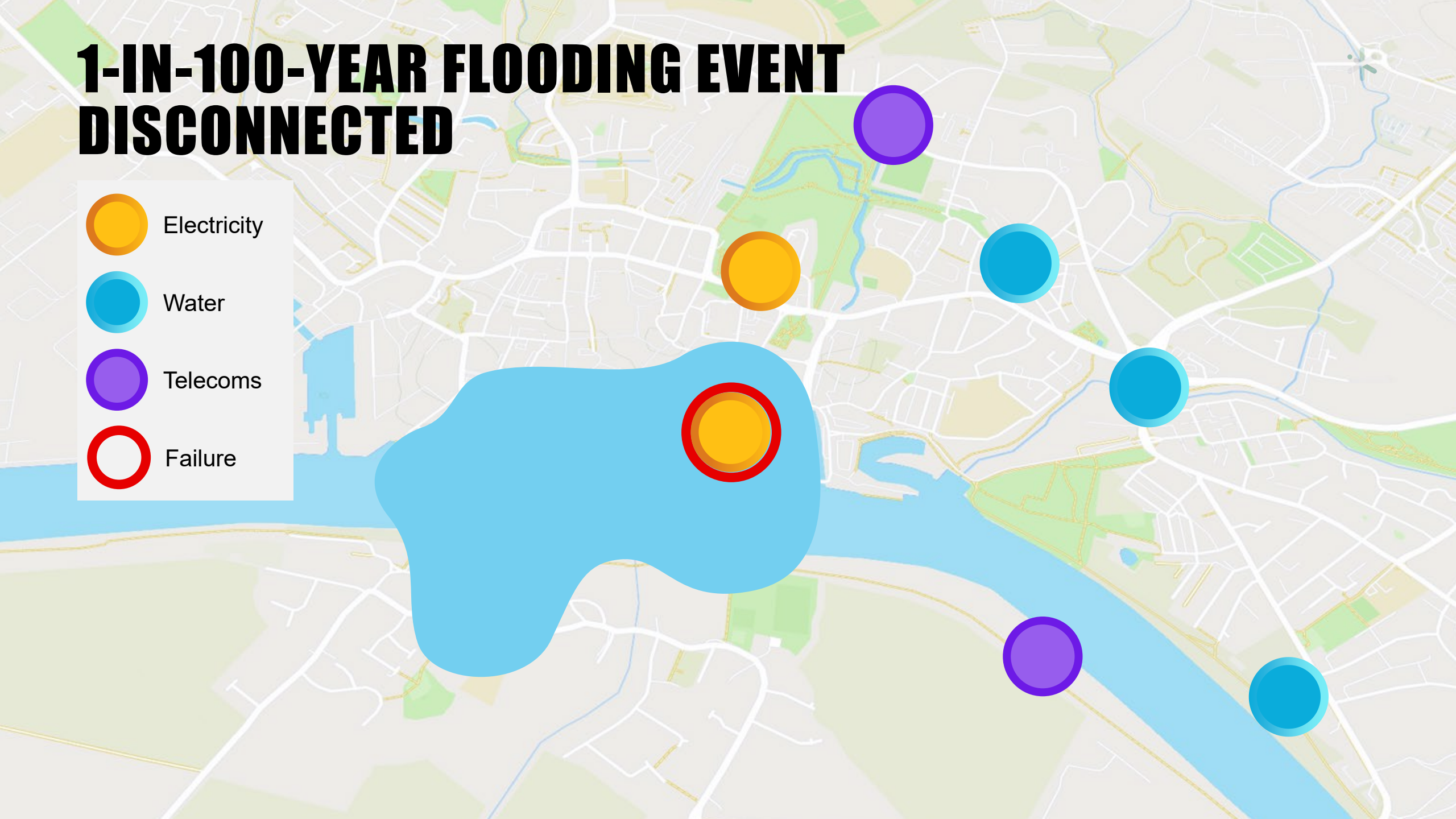


There is growing awareness that we have a poor understanding of infrastructure interdependencies and cascading climate risk

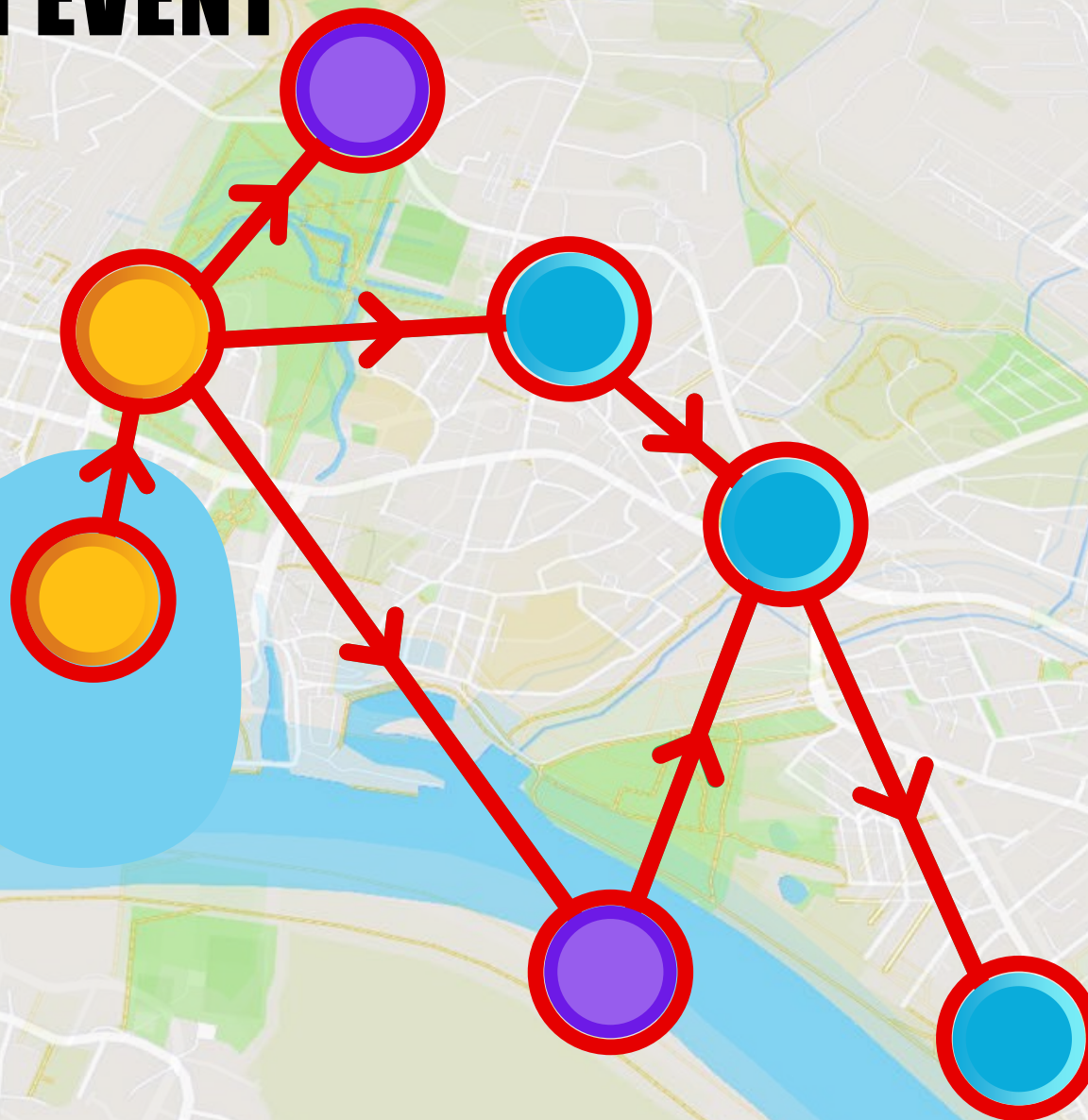
ROAD
CLOSED

1-IN-100-YEAR FLOODING EVENT DISCONNECTED

-  Electricity
-  Water
-  Telecoms
-  Failure

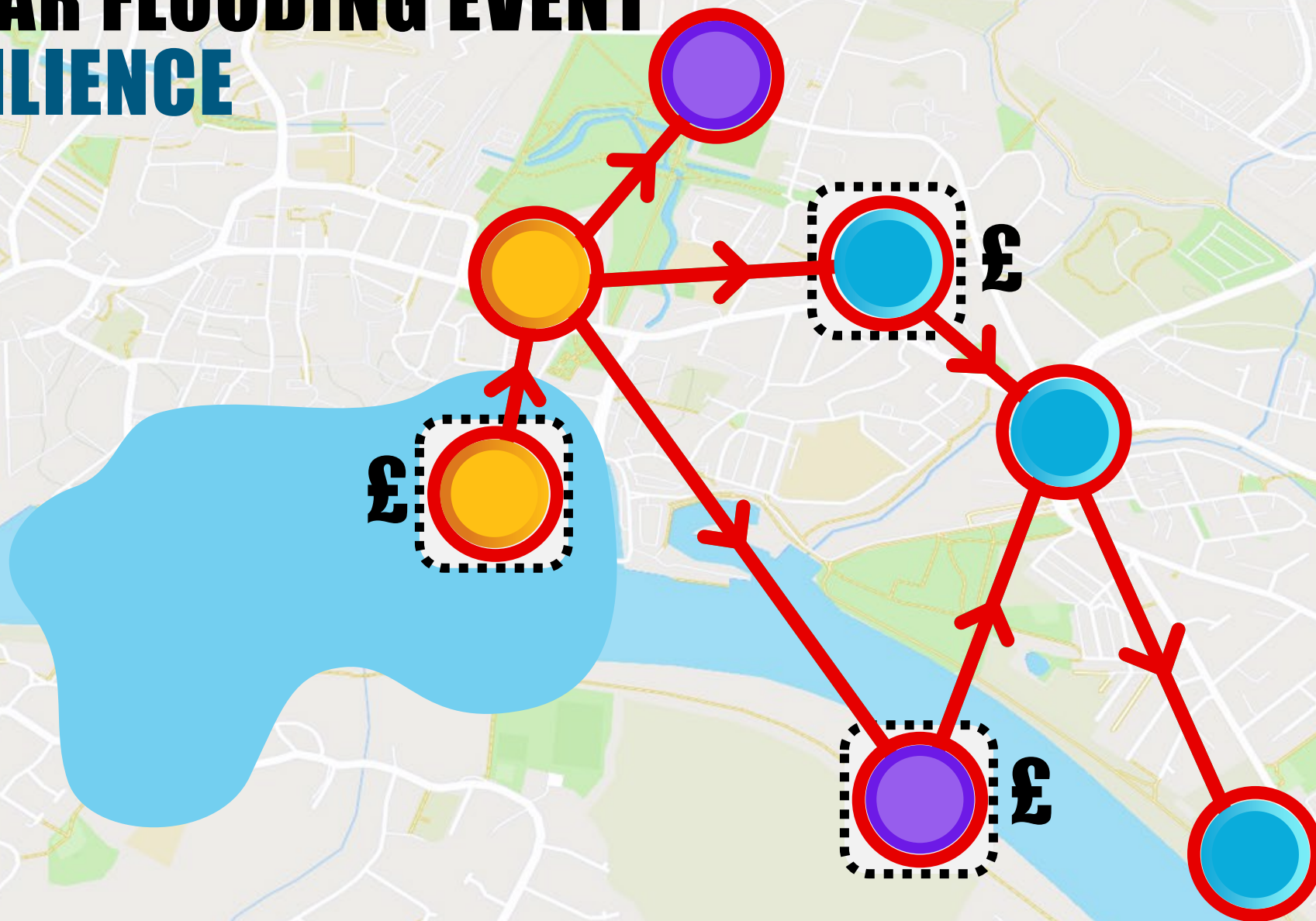
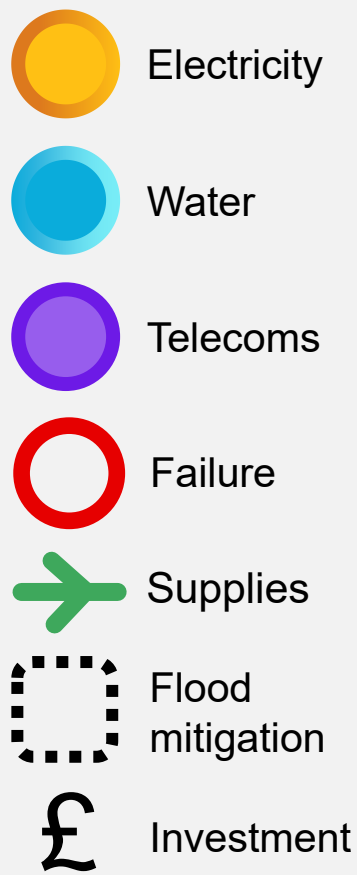


- Electricity
- Water
- Telecoms
- Failure
- Supplies










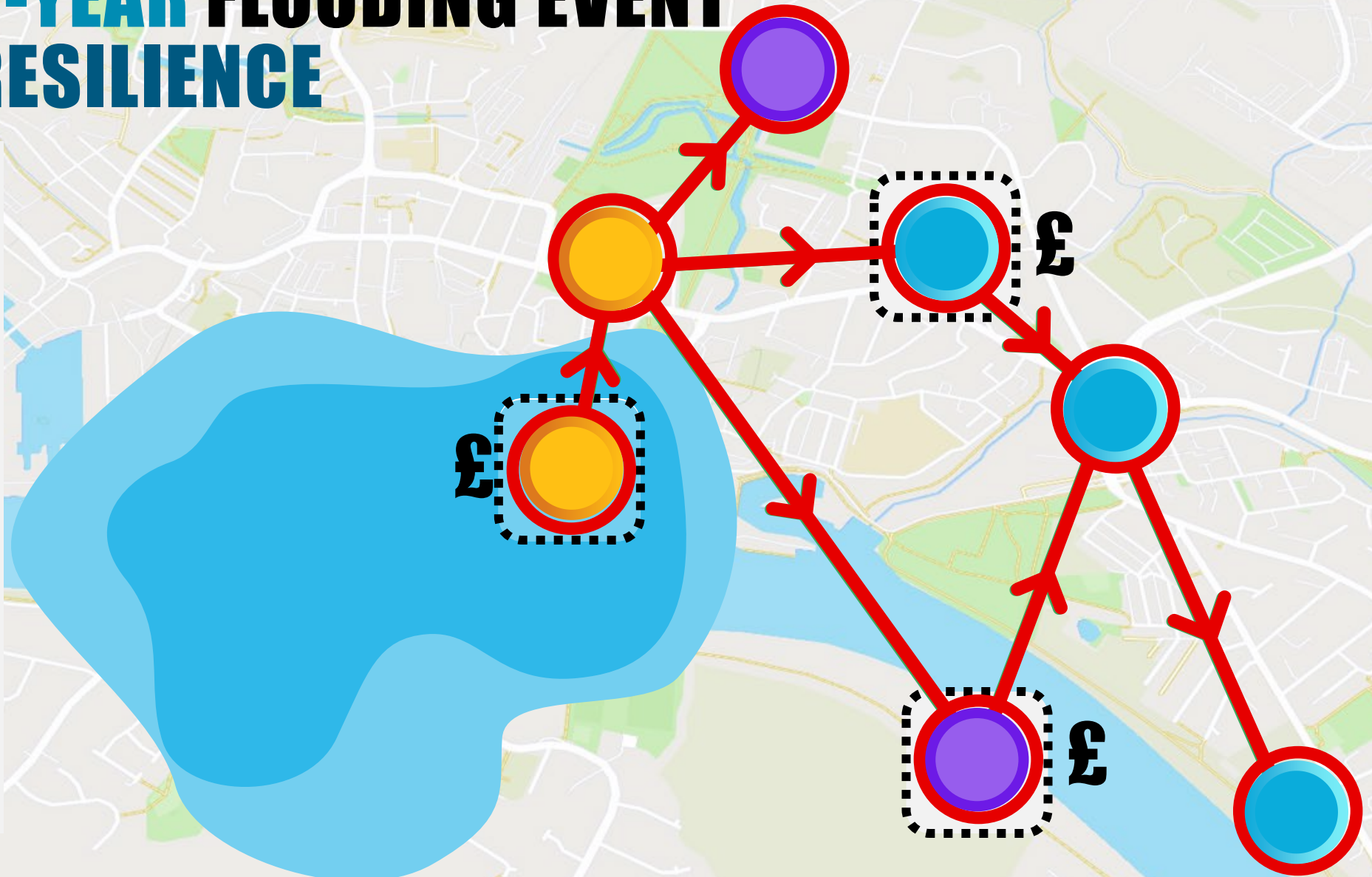
1-IN-100-YEAR FLOODING EVENT

SILOED RESILIENCE

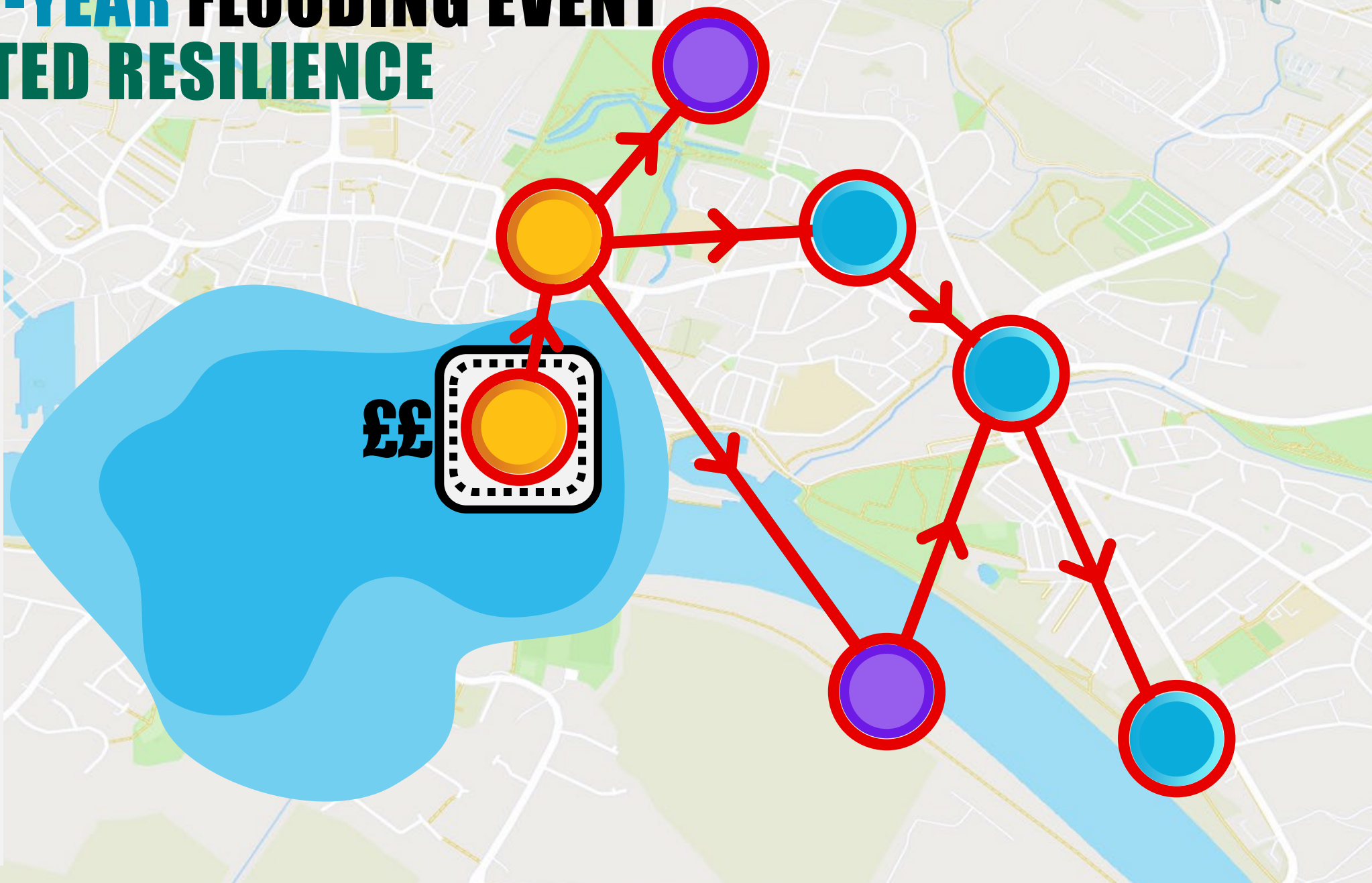


1-IN-200-YEAR FLOODING EVENT SILOED RESILIENCE

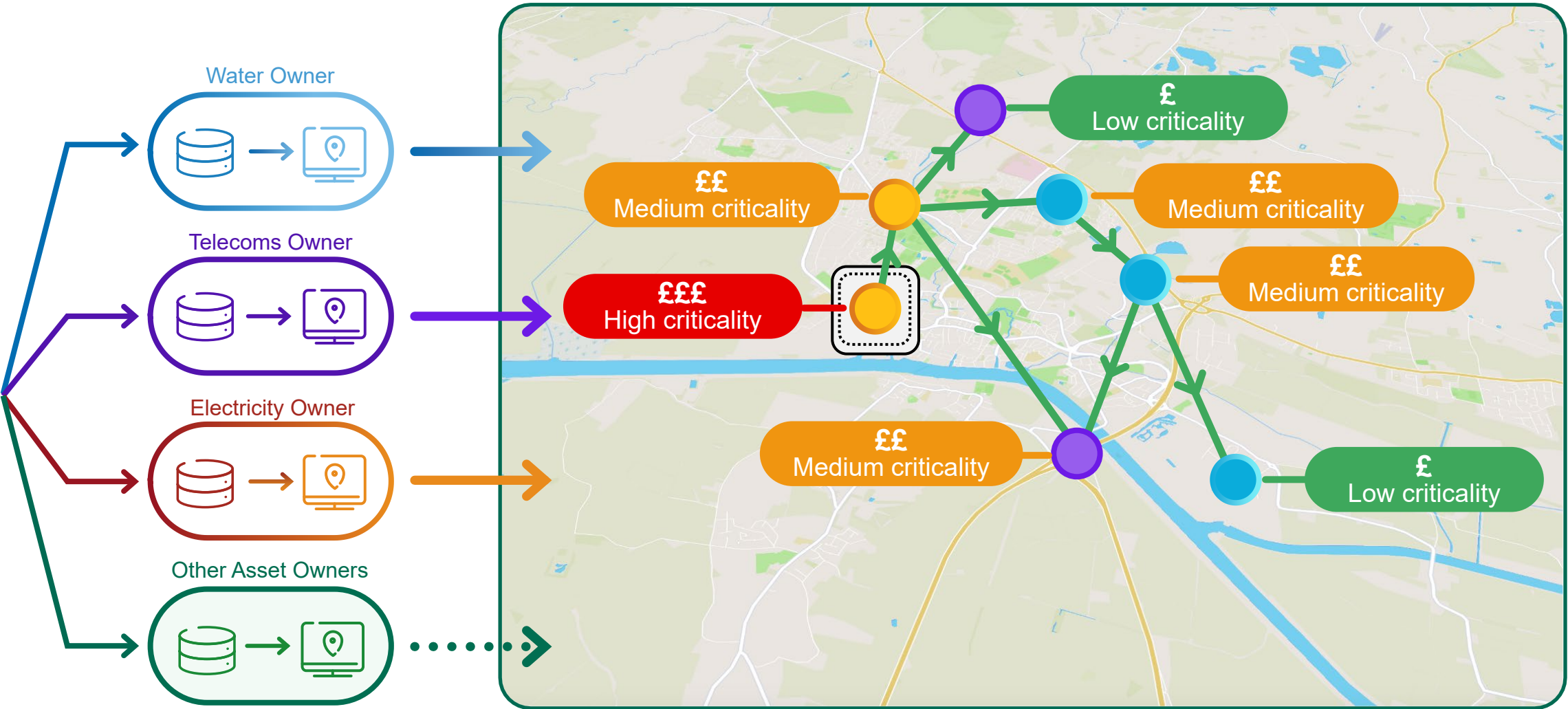
-  Electricity
-  Water
-  Telecoms
-  Failure
-  Supplies
-  Flood mitigation
-  Investment



1-IN-200-YEAR FLOODING EVENT CONNECTED RESILIENCE



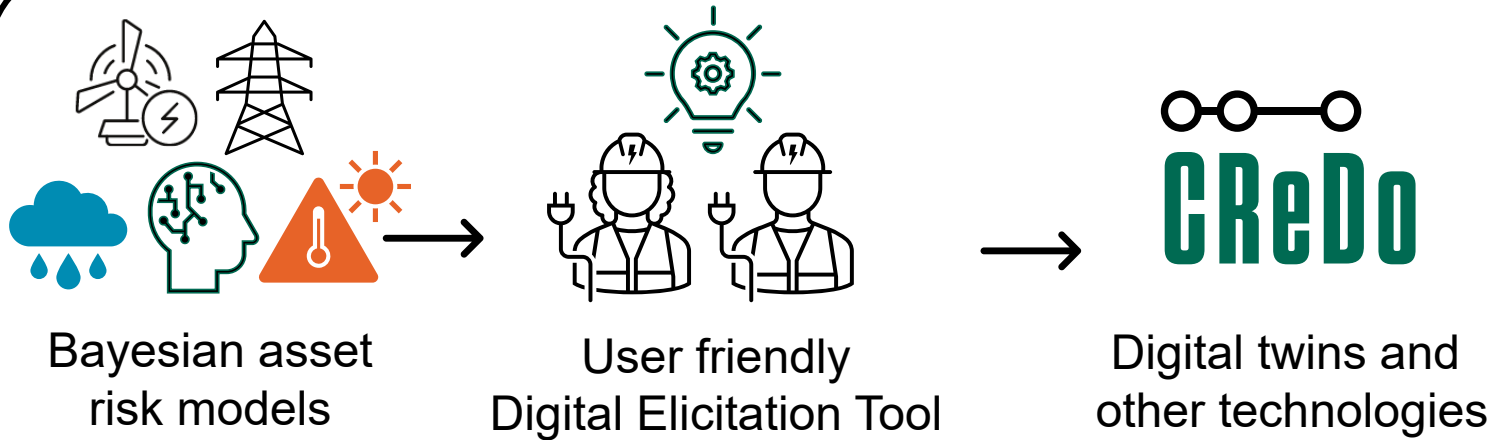
ENABLING STRATEGIC RESILIENCE PLANNING AND RISK REPORTING



CReDo+ ALPHA PHASE



Technology Development



Agile Ways of Working



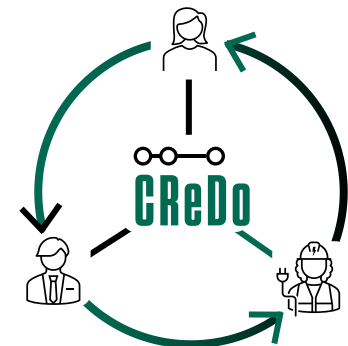
Two week sprints with Scrum
Transparency on dependencies
Demo playbacks and retros
Psychological safety



Strategy



Business case and
Cost-Benefit analysis

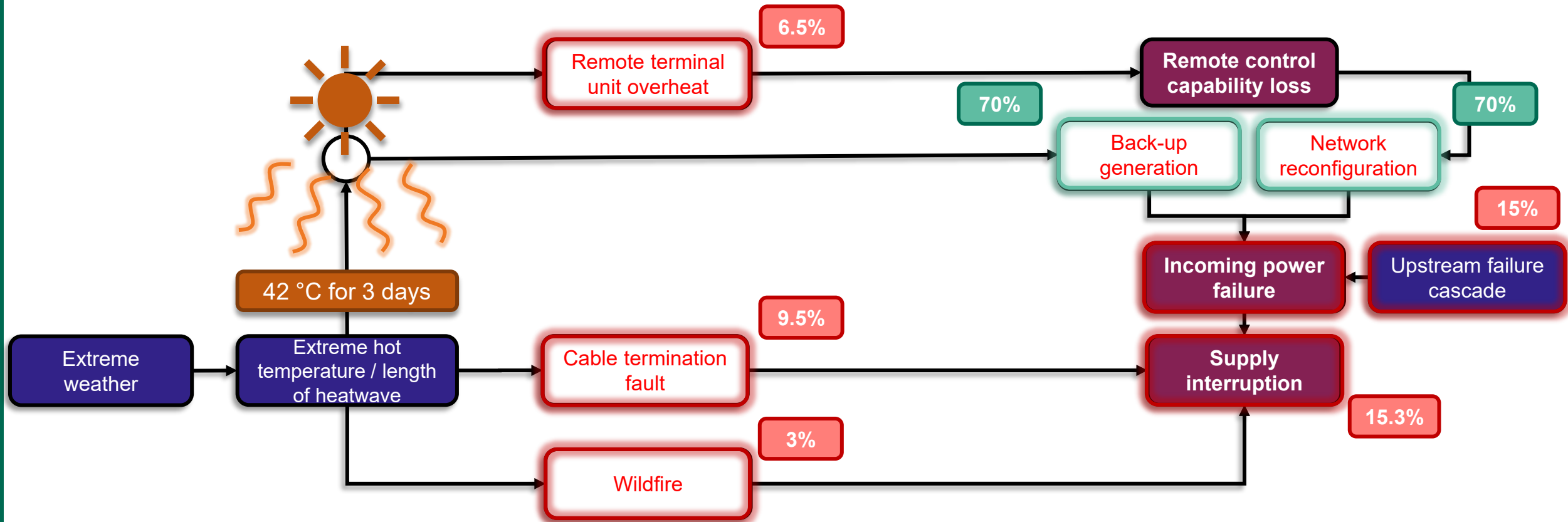


Engagement

BAYESIAN ASSET RISK MODELLING



Historic data not always available → use tacit knowledge from subject matter experts encoded into likelihood and risk models



What is the chance that each individual event takes place?



What is the likelihood of a supply interruption?

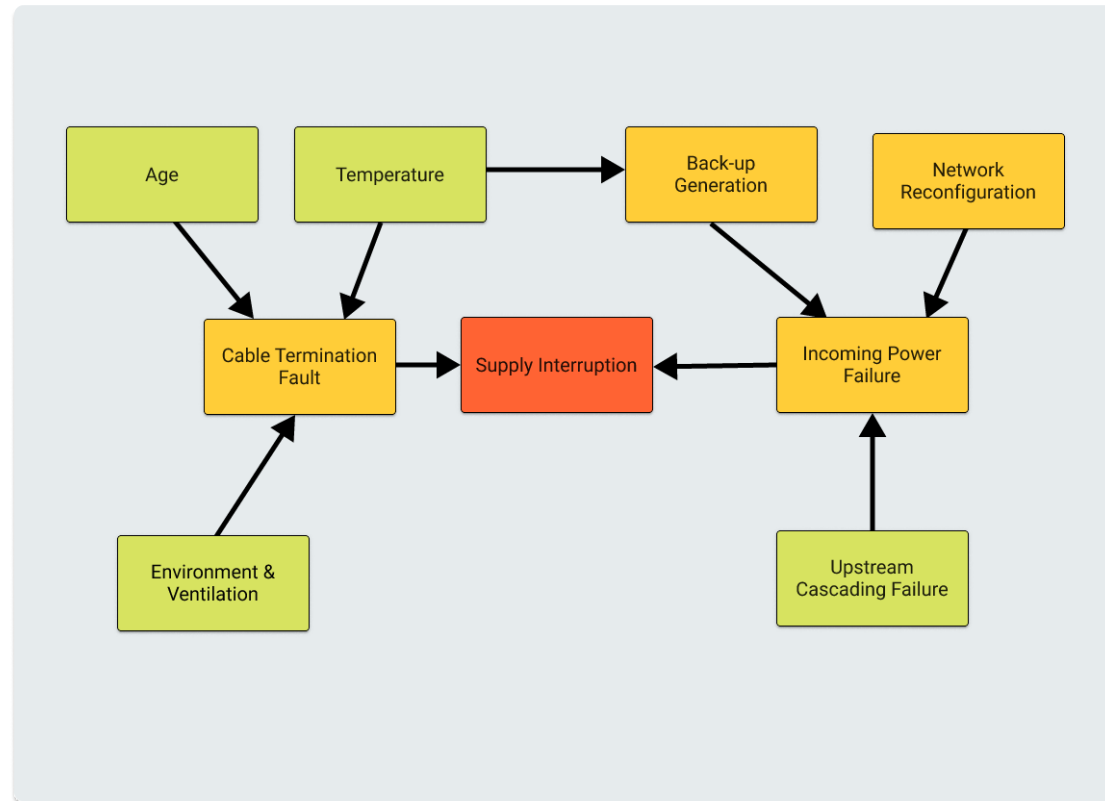


What is the chance of being impacted by other sites?

DIGITAL ELICITATION TOOL



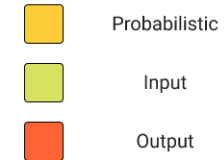
Model Builder - Structure



ADD VARIABLE

REMOVE VARIABLE

REVIEW COMMENTS



CONTINUE TO MODEL INPUTS

BACK

HELP

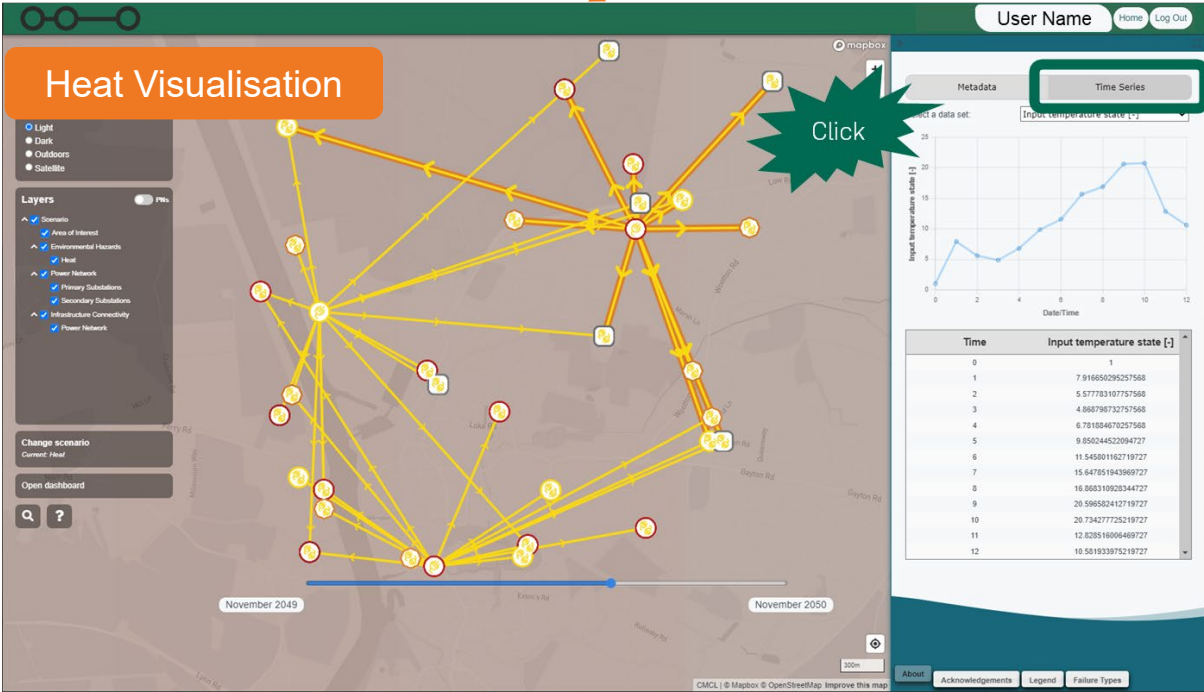
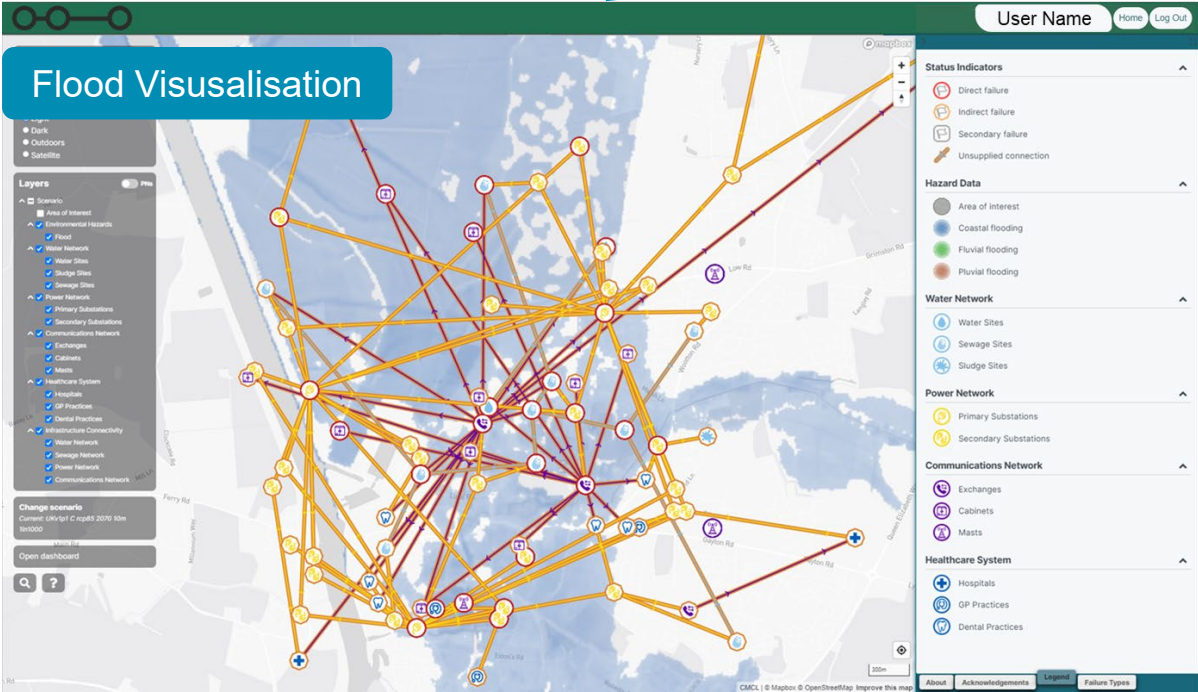
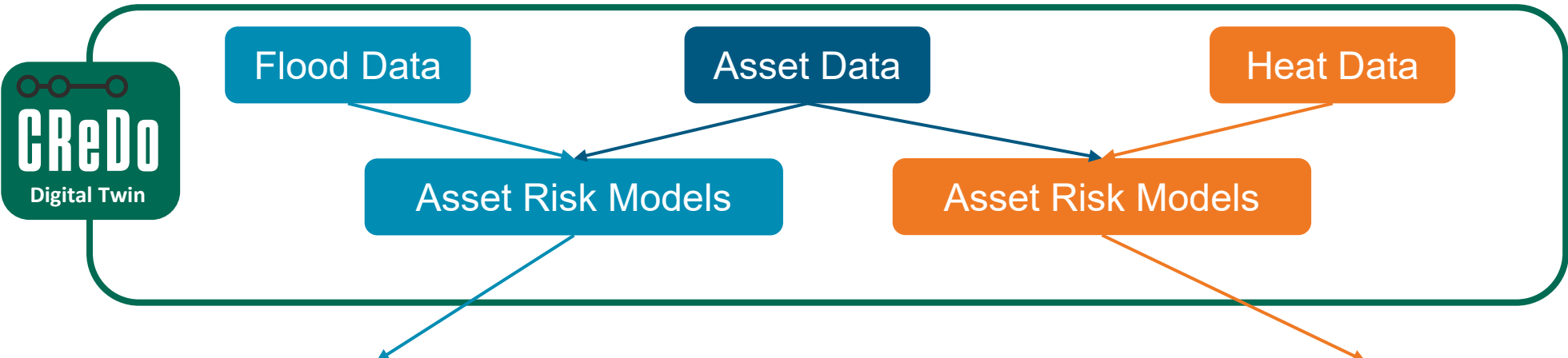
SAVE & EXIT

Prototyped user-friendly tool

Digitise subject matter expert knowledge

Scale building of asset risk models

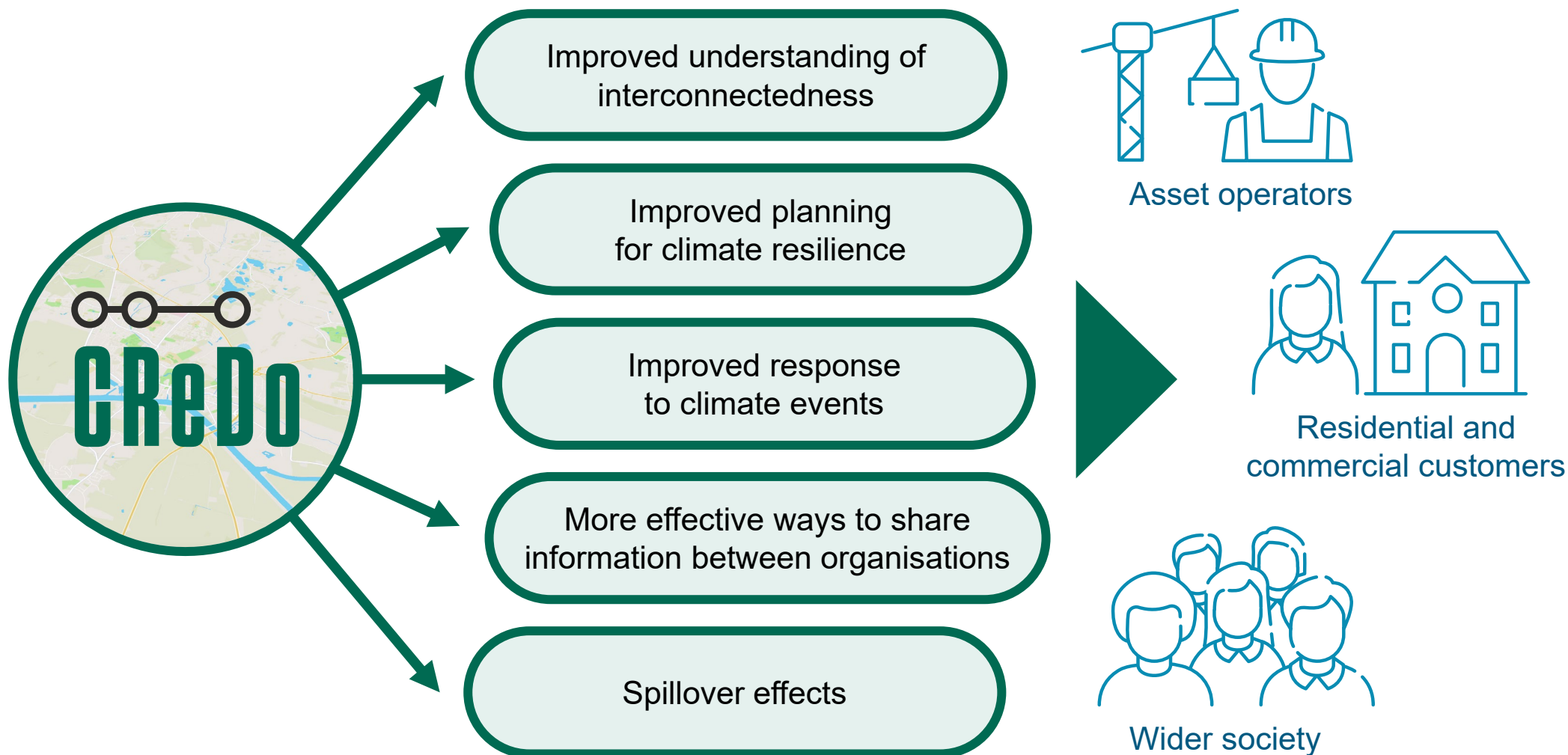
CReDo PLATFORM



EXPECTED BENEFITS



CReDo's decision intelligence finds benefit-cost ratio of up to 55 for flood resilience investment



ENGAGEMENT



CRoDo+ Resilience Innovation Working Group

- Four sessions
- Thirteen energy network licensees
- Six SIF projects sharing learnings
- CRoDo technical showcase
- Beta Phase collaboration
- Emerging themes: resilience metrics, costing resilience, risk modelling, weather data, use cases

Wider Engagements

- User research with UK Power Networks and National Grid Energy System Operator
- Four SIF project bilateral engagements
- BBC World Service - Digital Twins
- Ten conferences on digital twins and climate resilience
- ENA resilience working group
- Teach-ins

CRedo+ BETA PHASE

Mission

- Enable coordinated decision making and efficient investment
- Understand infrastructure interdependencies and cascading risk
- So that together we can increase resilience to extreme weather and adapt to climate change

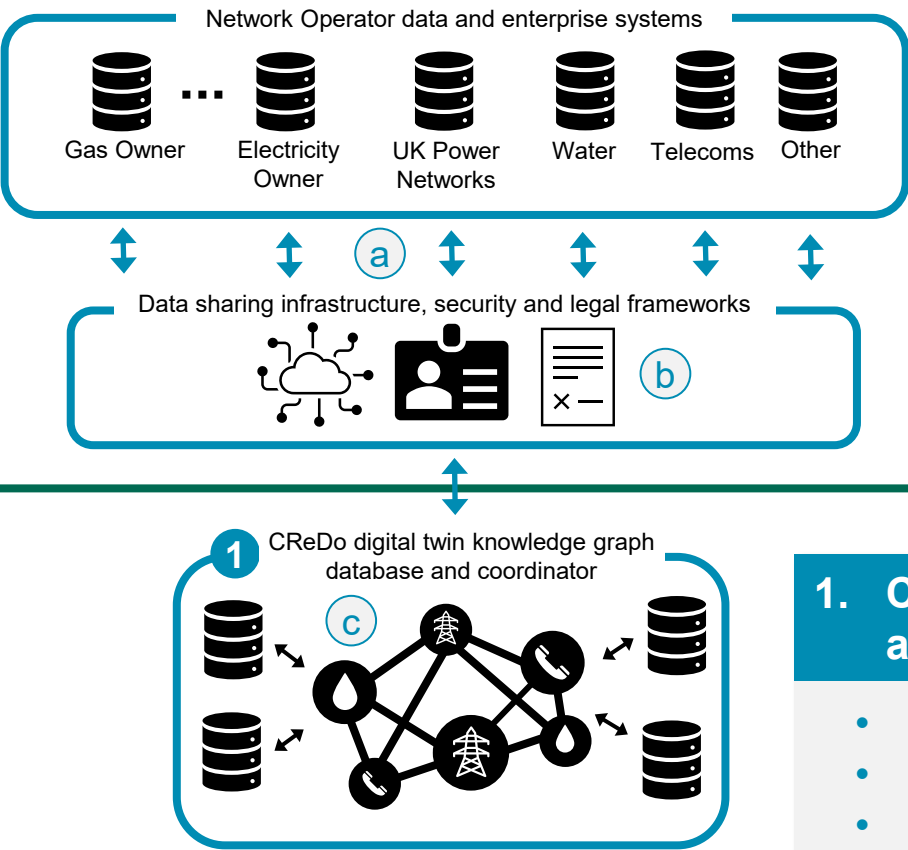
USP

- Connect data across siloed organisational boundaries
- Enable a whole system approach to risk modelling
- Allows users to see who they are dependent on to support better decision making and reporting

CRedo+ Goals

- Scale CReDo technology across energy sector
- Support connected climate resilience investment planning and reporting
- Commercialise a sustainable digital platform that enables further use cases

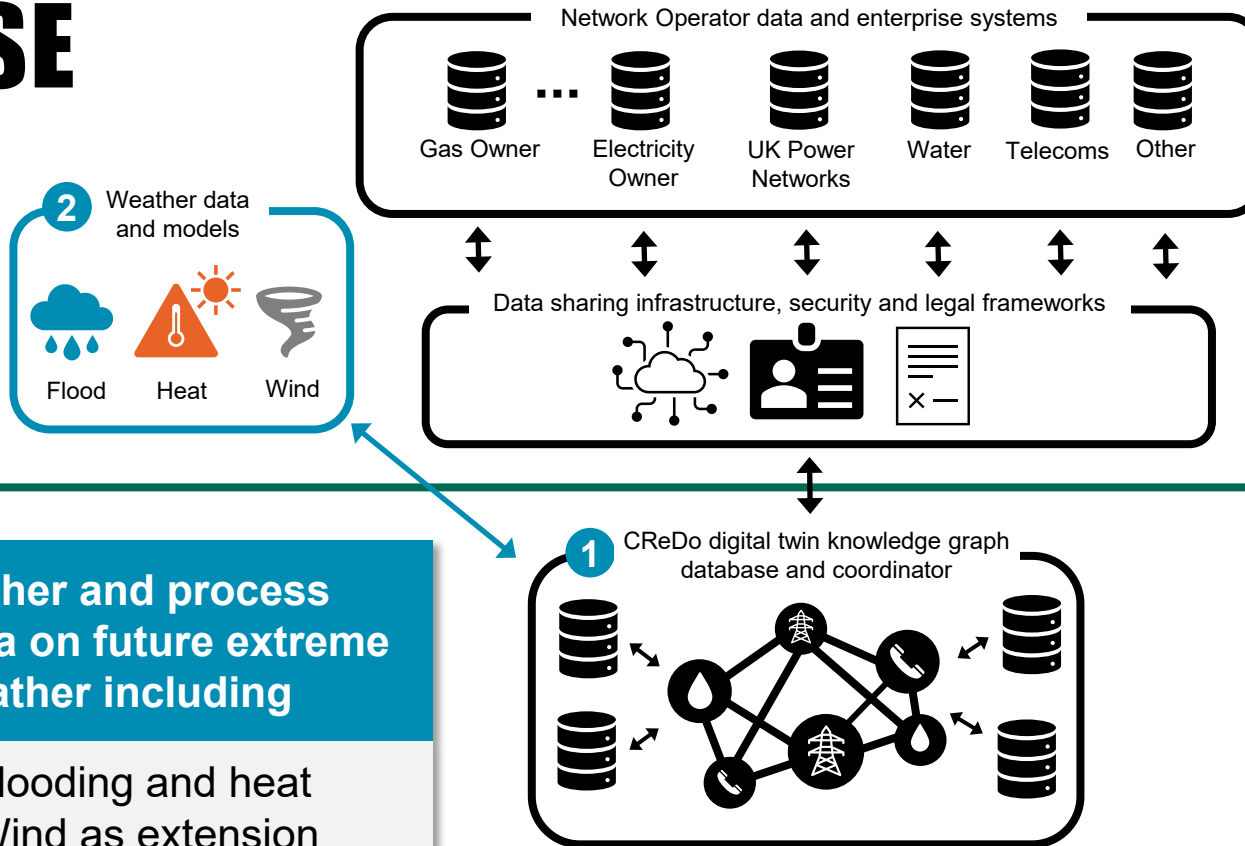
BETA PHASE



1. Connect network and asset data across organisations

- Secure data sharing infrastructure
- Legal and trust frameworks
- Digital Twin and Knowledge Graph technologies

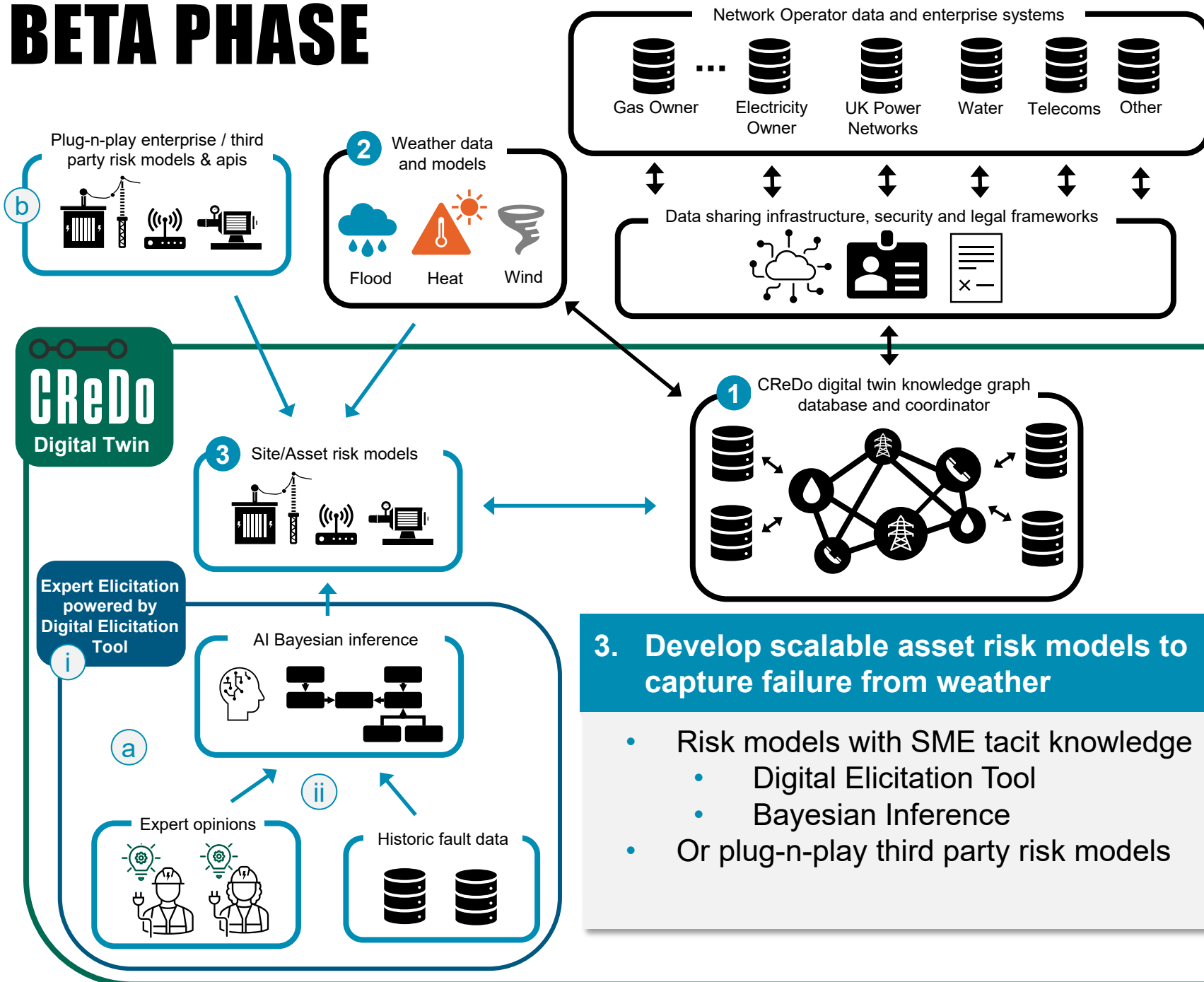
BETA PHASE



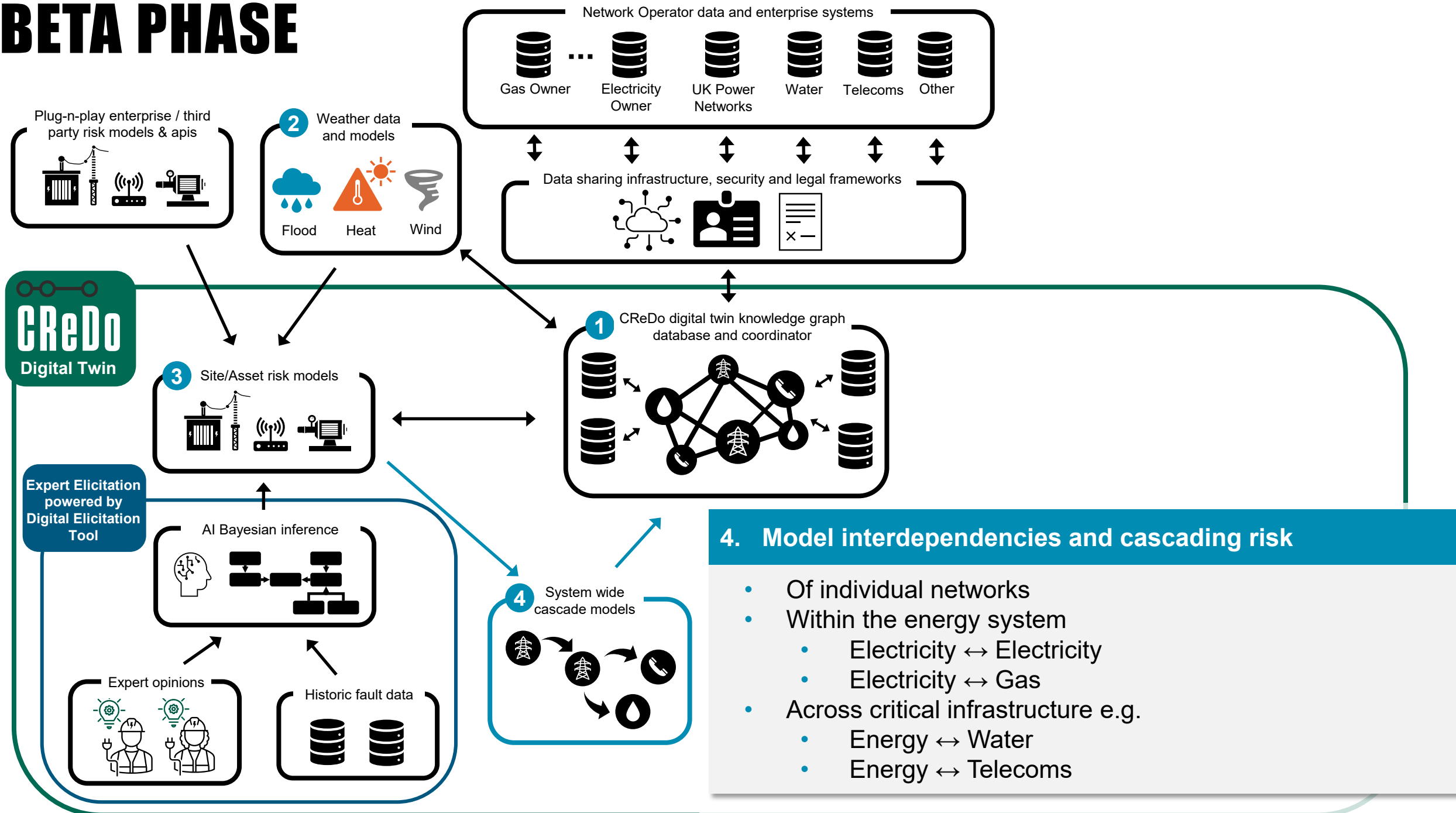
2. Gather and process data on future extreme weather including

- Flooding and heat
- Wind as extension
- Other events

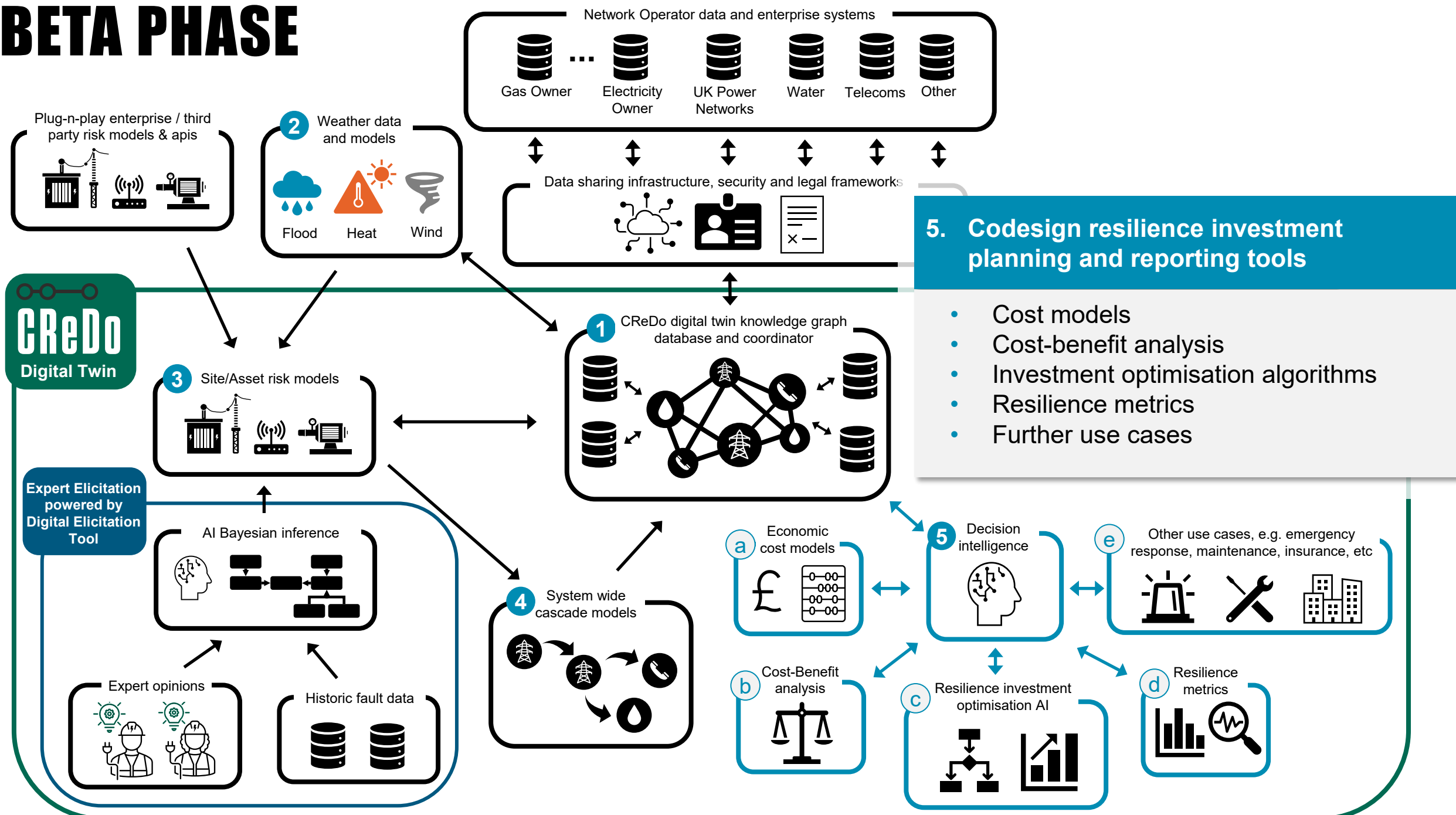
BETA PHASE



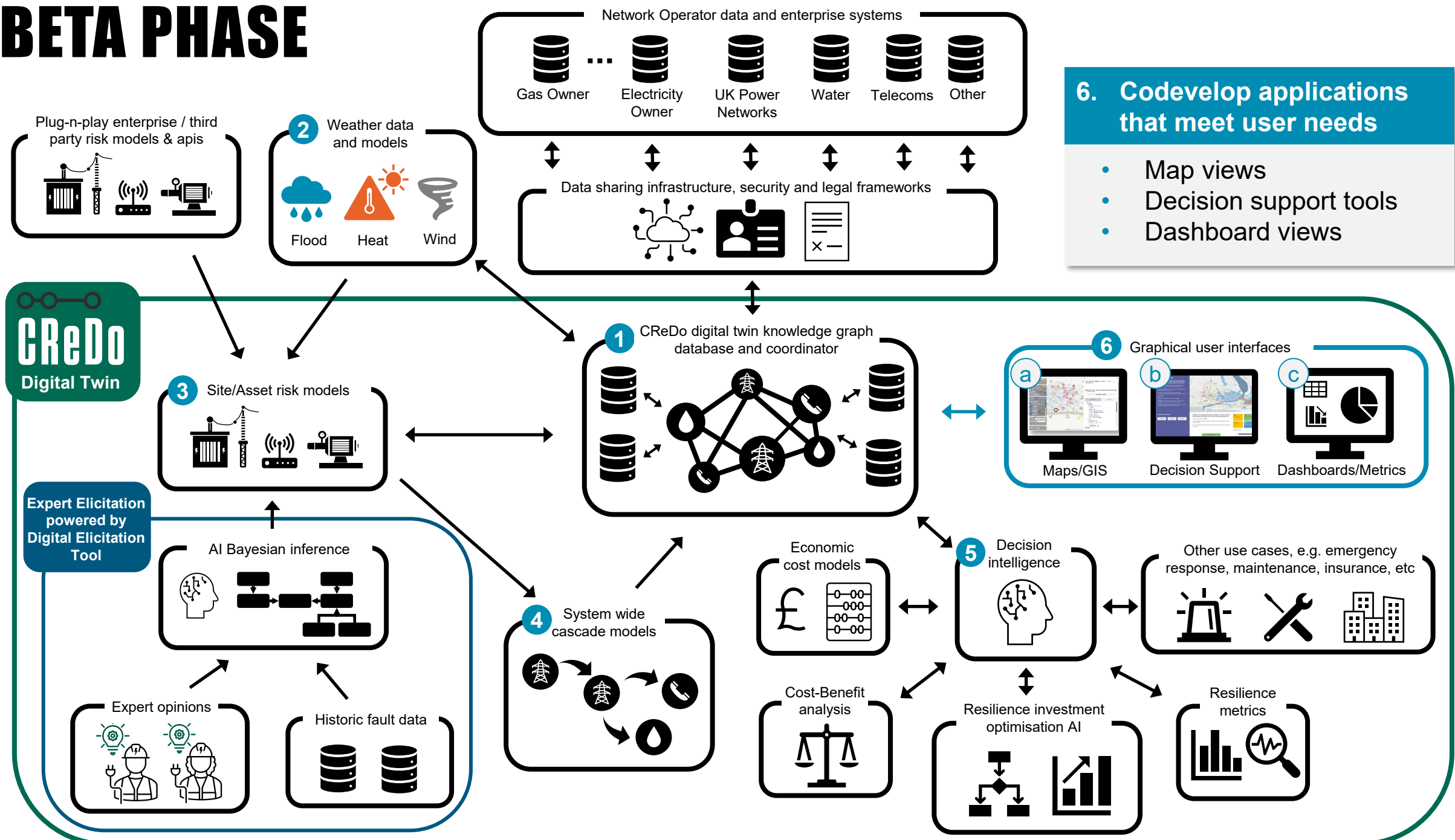
BETA PHASE



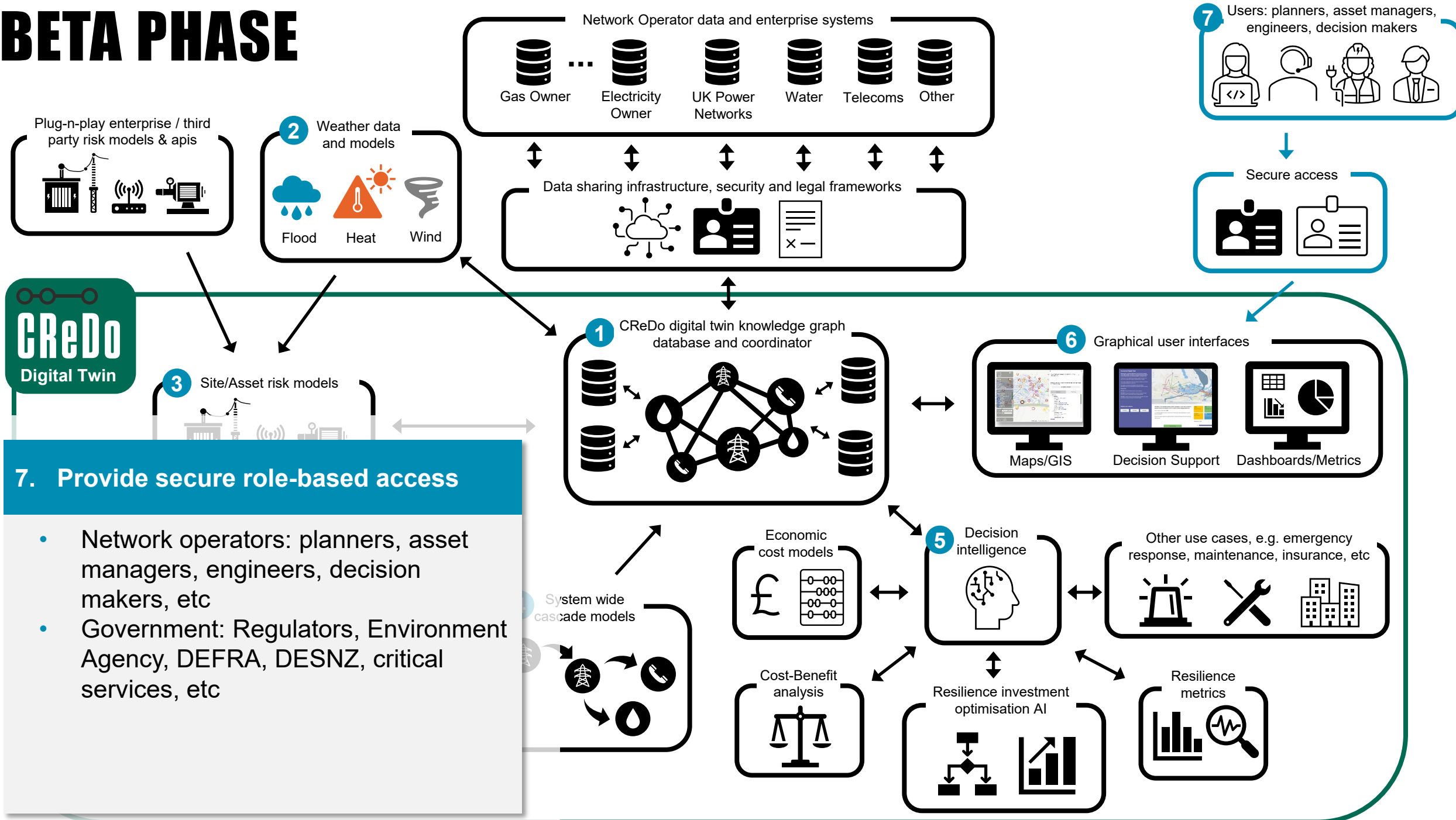
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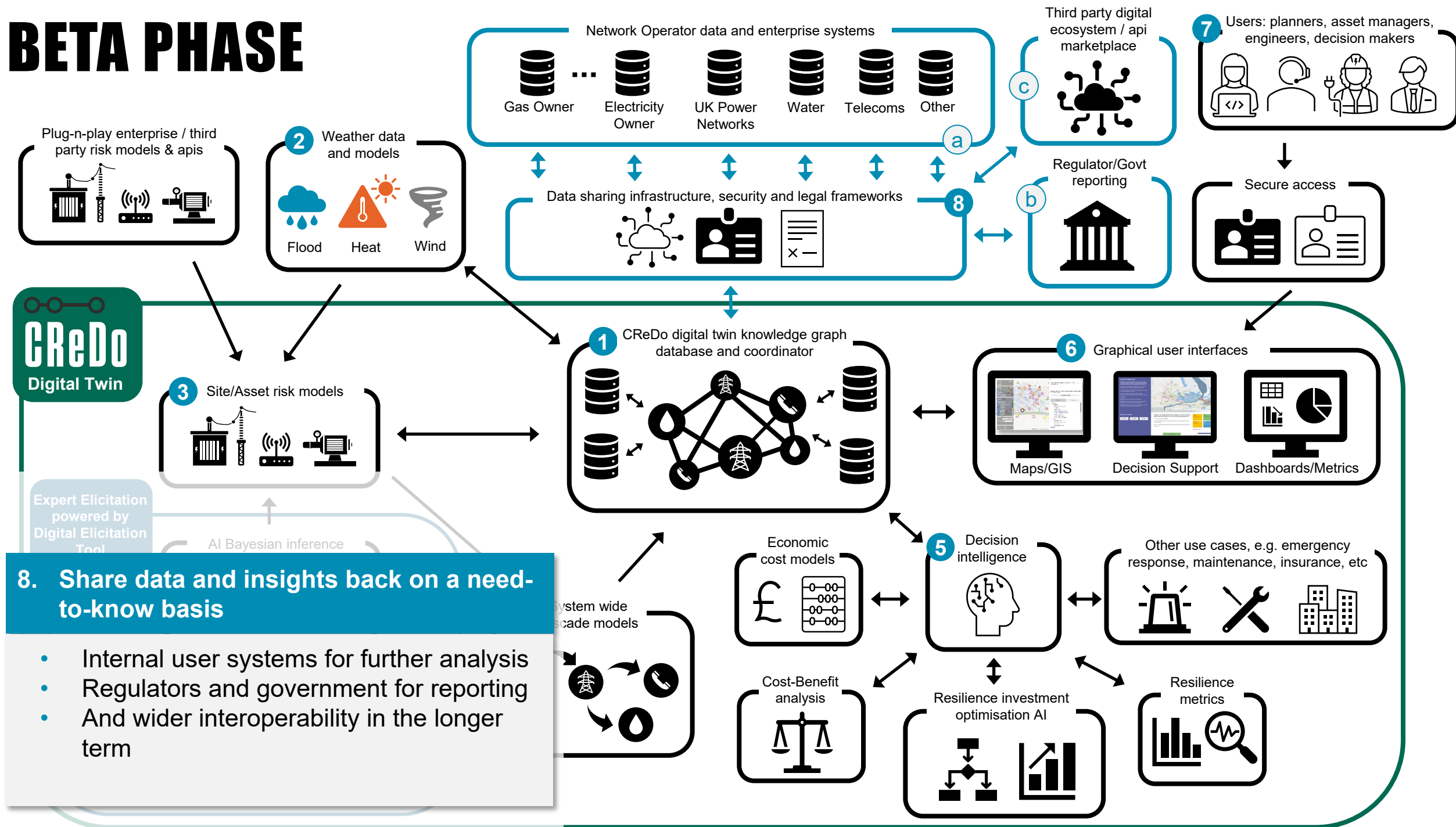
BETA PHASE



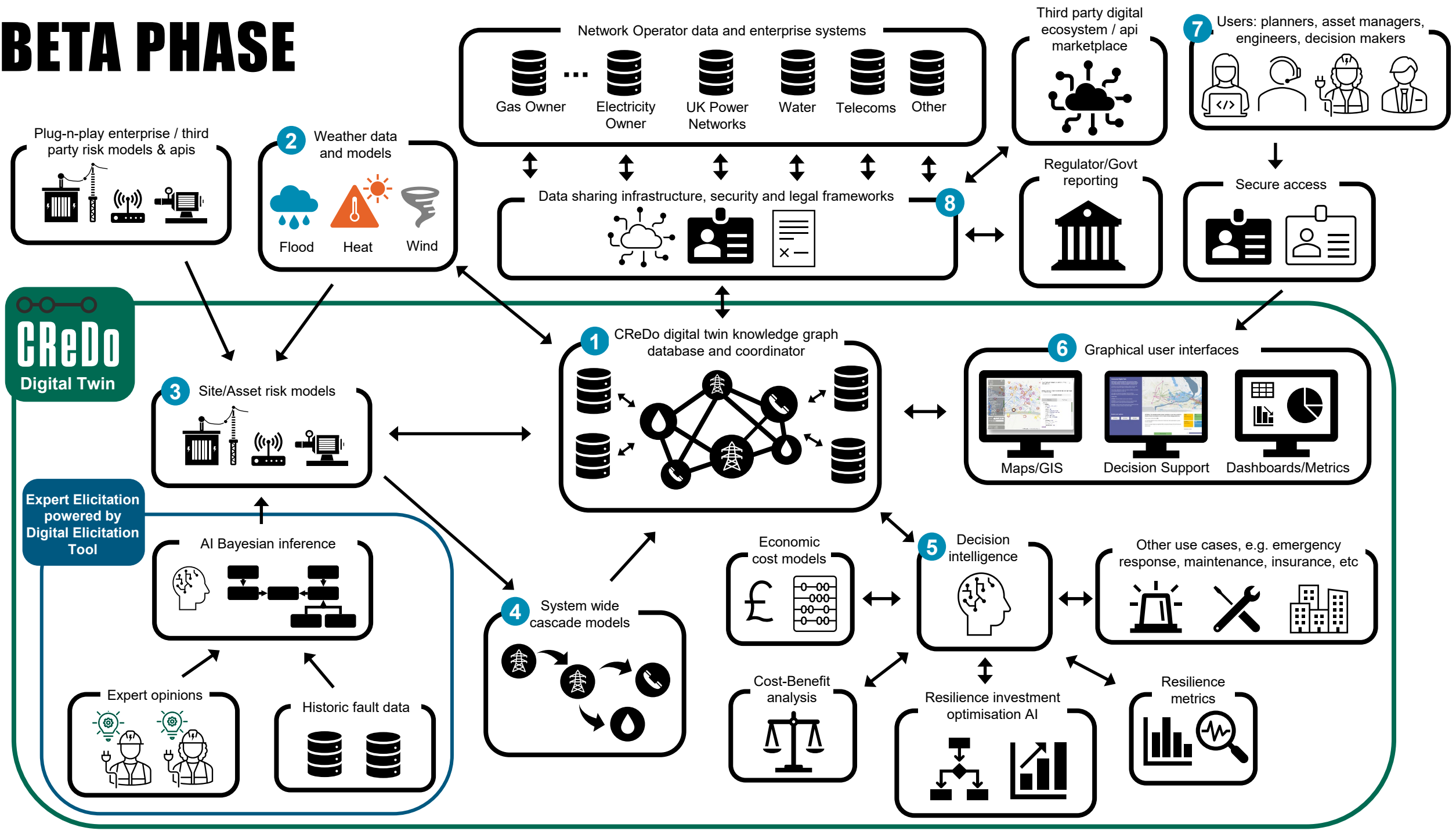
BETA PHASE



BETA PHASE



BETA PHASE



THANK YOU

James Daniel – Innovation Manager (UK Power Networks)
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Elliot Christou – Tech Lead (Connected Places Catapult)