Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

Notes to reader:

These slides are a snapshot of the work to date on the Virtual Energy System underpinning framework. The intent is to share the evolving knowledge and learnings with industry. For more information on the latest developments please contact VirtualES@nationalgrid.com

THE SESSION WILL BE STARTING SHORTLY

All questions via Slido
slido.com
Code: #VirtualES

GET IN TOUCH: VIRTUALES@NATIONALGRIDESO.COM

Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

VIRTUAL ENERGY SYSTEM

BUILDING THE DATA SHARING INFRASTRUCTURE

JANUARY 2024

All questions via Slido
slido.com
Code: #VirtualES

Simon Evans
Programme Director, Virtual Energy System

AGENDA – THE NEXT 45 MINUTES

- **Introductions**
  2 mins: *Dial-in buffer & context*
- **Recap of the programme**
  5 mins: *Objectives and work to date*
- **Merging Models**
  5 mins*: Approach to connecting neighbouring nodes*
- **NDTP & ESO Technical Alignment**
  4 mins: *Outline of level 2 MVP Architecture*
  2 mins: *Summary of NDTP alignment*
- **Security**
  5 mins: *Approach to managing security*
- **Next Steps**
  5 mins: *Roadmap of upcoming work*
- **Q&A**

All questions via Slido
slido.com
Code: #VirtualES

ESO

Virtual Energy System
Powered by ESO

INTRODUCTIONS

ESO

ARUP

CATAPULT Energy Systems

IB1 Icebreaker One

Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

RECAP OF PROGRAMME

Jonathan Barcroft
Workstream Manager, ESO

All questions via Slido
slido.com
Code: #VirtualES

VIRTUAL ENERGY SYSTEM

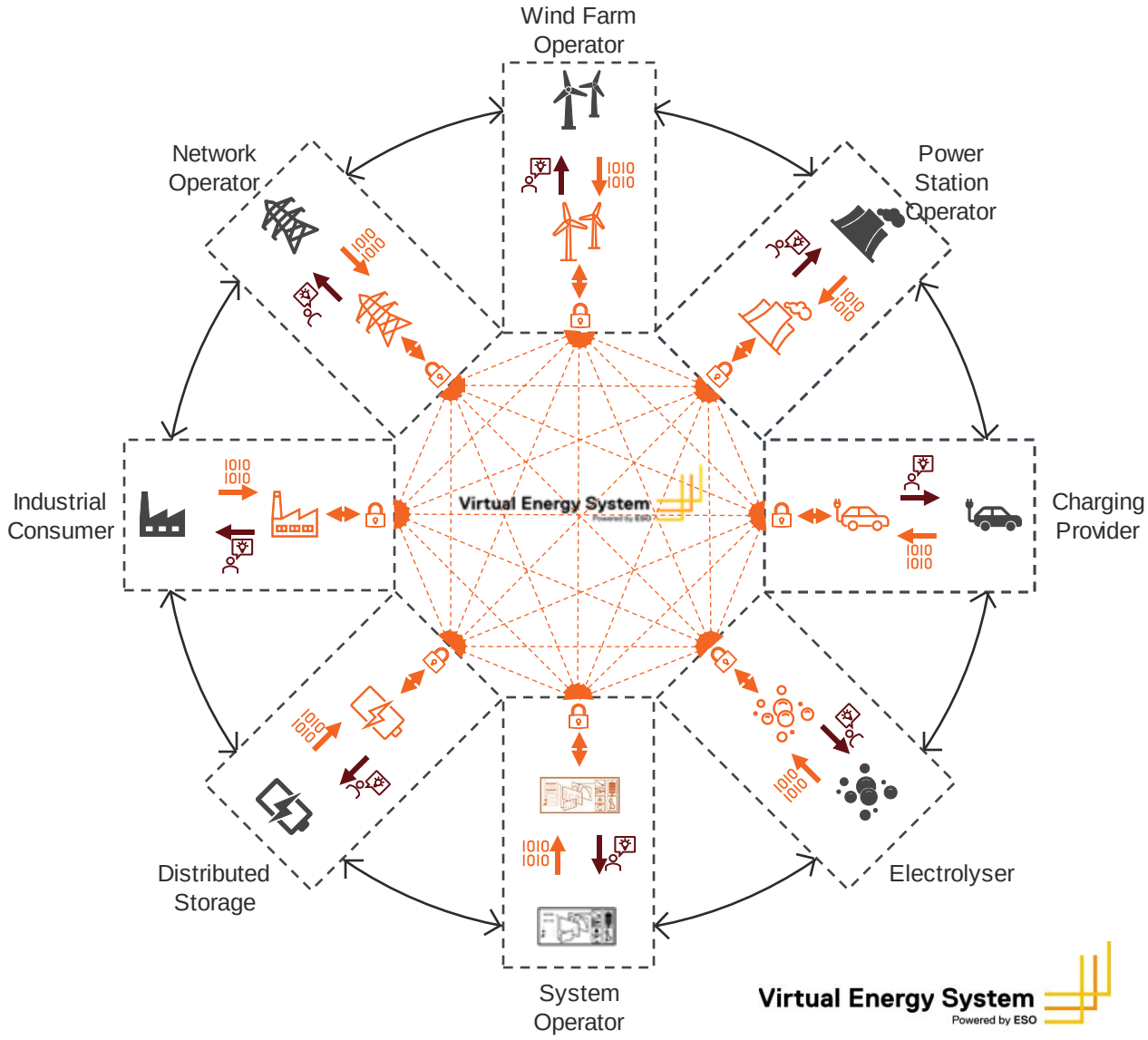
Mission statement:

Creating the common **data sharing infrastructure**

to enable an ecosystem of **connected digital twins**

that will facilitate the transition to net zero.

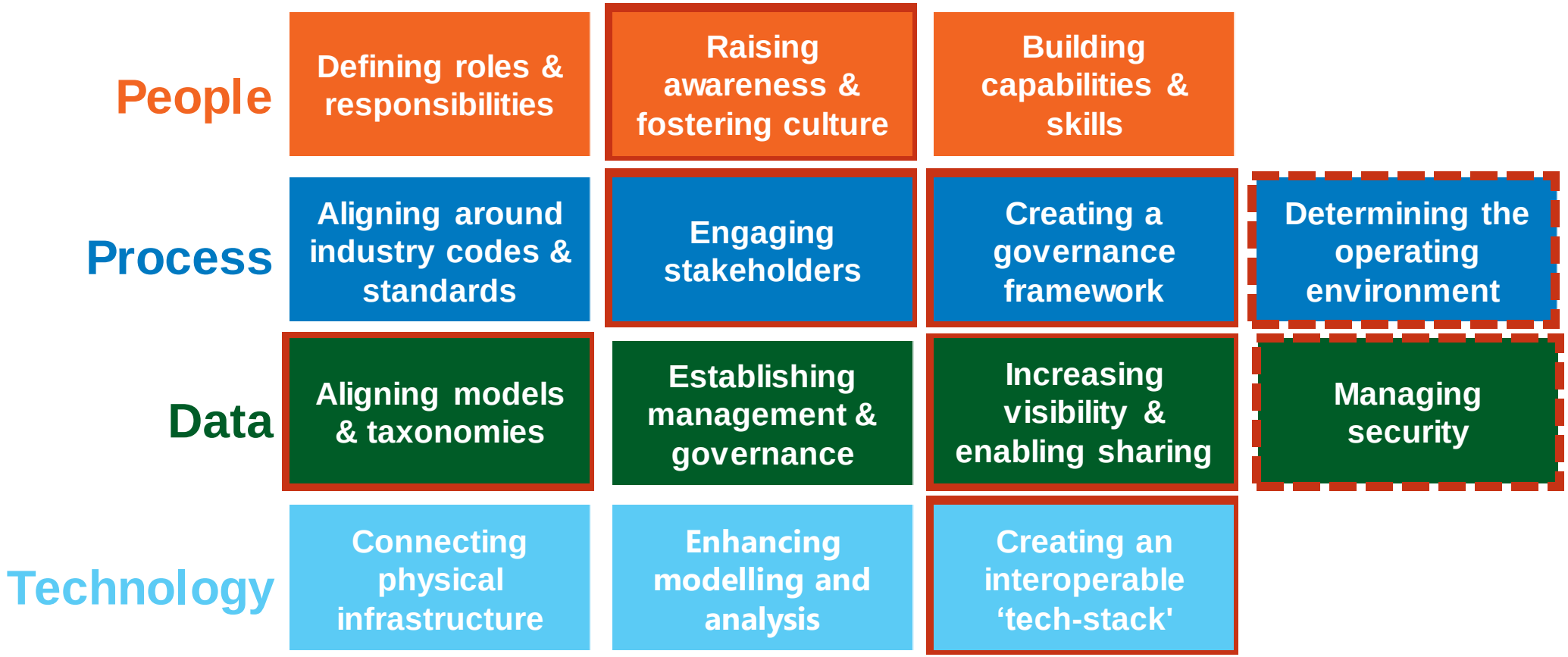
(e.g. energy optimisation, carbon reporting, investment planning, …net zero energy transition)



ESO

Virtual Energy System
Powered by ESO

COMMON FRAMEWORK



PROJECT TIMELINE

Define the vision

Dec 21 – Feb 22

Benchmarking & key factors

- Identified global best practices for connecting digital twins
- Refined learning of these into key factors required for interoperability

Sketch the concept

Mar 22 – Apr 22

Discovery

- Tested key factors with industry
- Recommendation to create tangible demonstrator of the framework in practice

Develop enablers

Jul 22 – Sep 22

Data standards, use case, & advisory groups

- Reviewed industry maturity in data standards and data portals to set direction
- Refine use case
- Published strategy for advisory groups

Set design principles

Nov 22 – Aug 23

Common framework demonstrator

- Developing industry-validated governance model and technology requirements.
- Creating wireframe of demonstrator

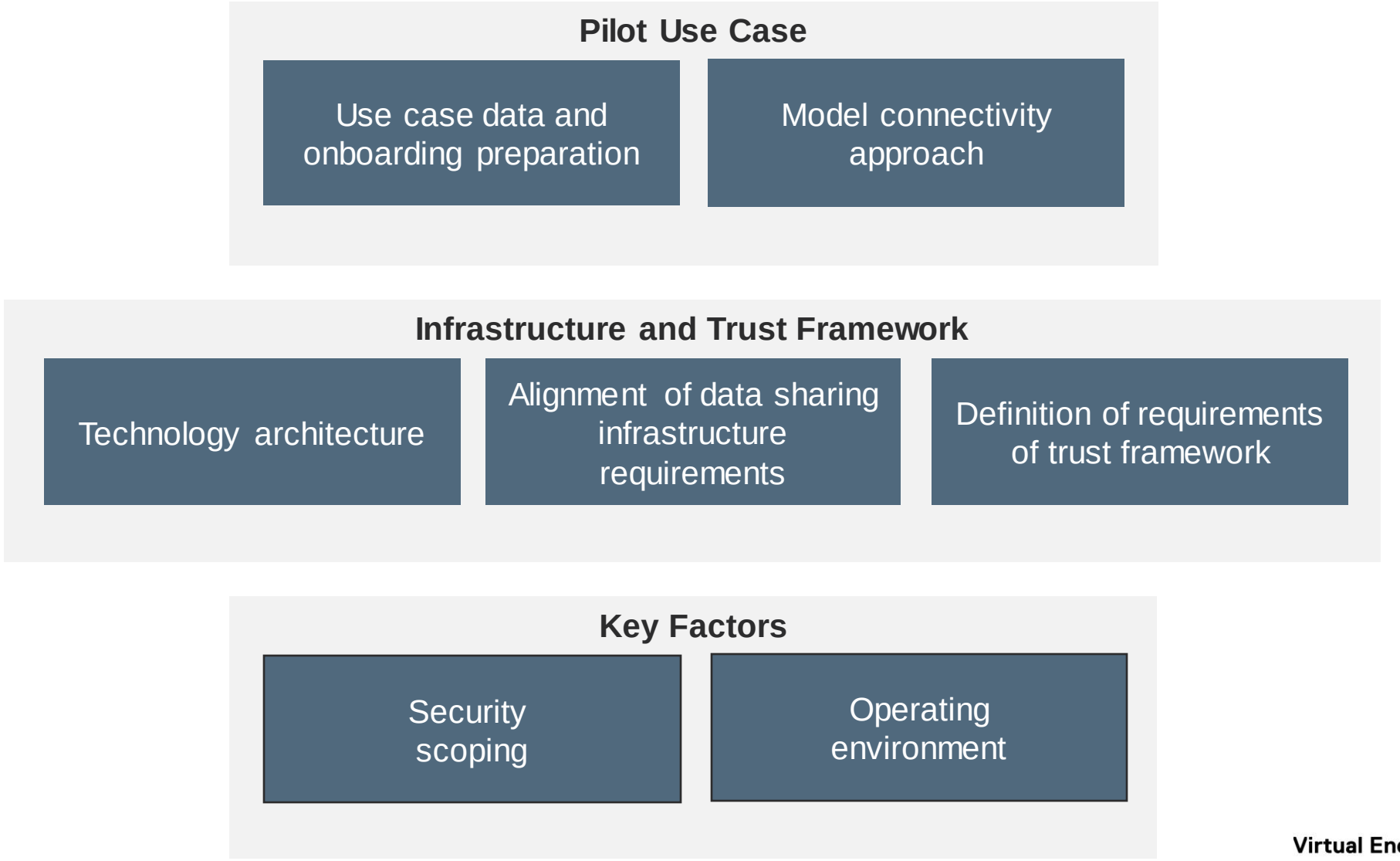
Align & Plan

Nov 23 – Mar 24

Alpha

- Technical alignment with NDTP and Open Energy on the data sharing infrastructure logical architecture
- Develop the operating environment, and security model

OVERVIEW OF OUR CURRENT PHASE



Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

MERGING MODELS

Ed Rous-Eyre
Senior Consultant, Arup

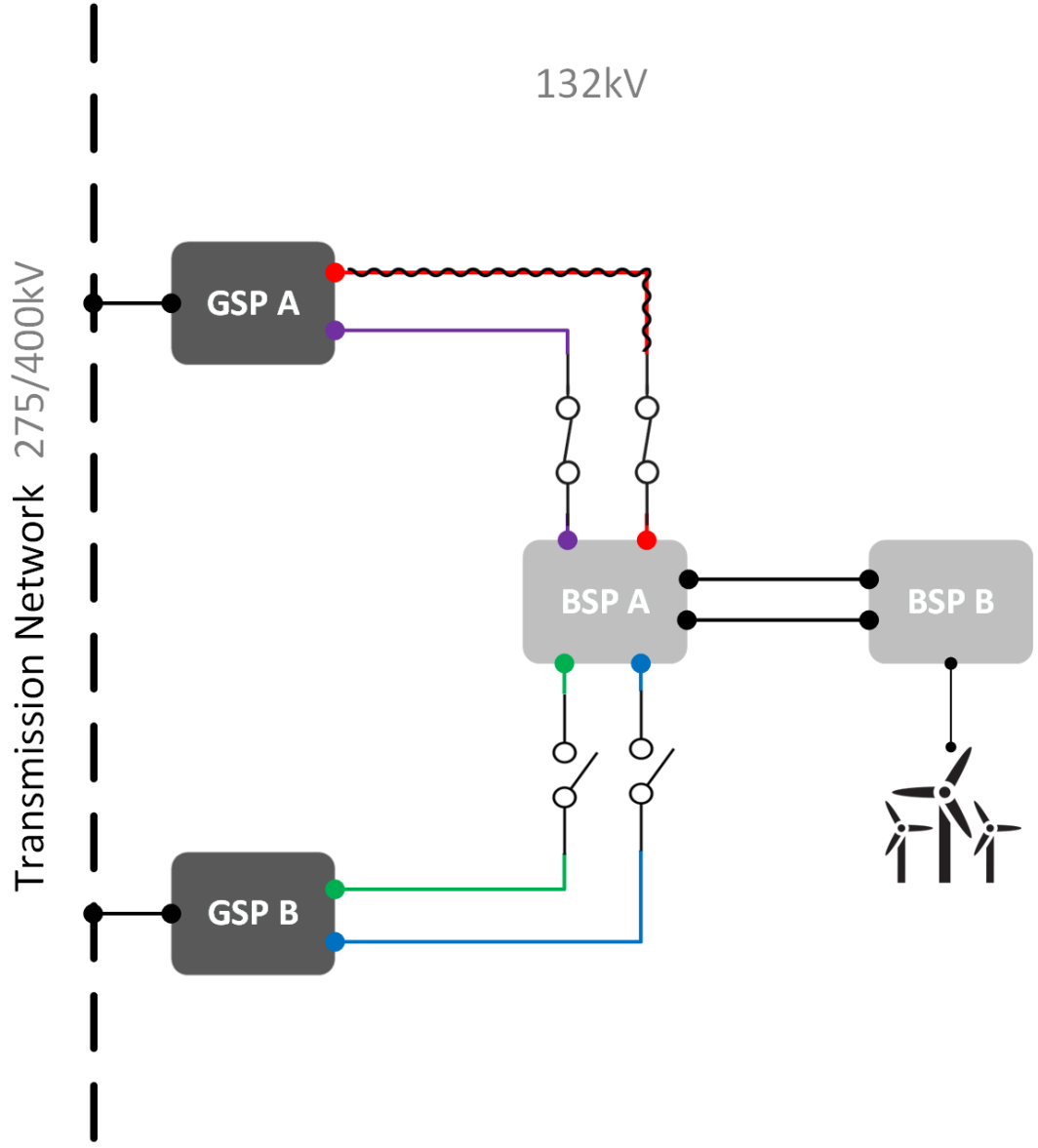
All questions via Slido
slido.com
Code: #VirtualES

VALIDATING THE USE CASE

Use case: Outage planning process

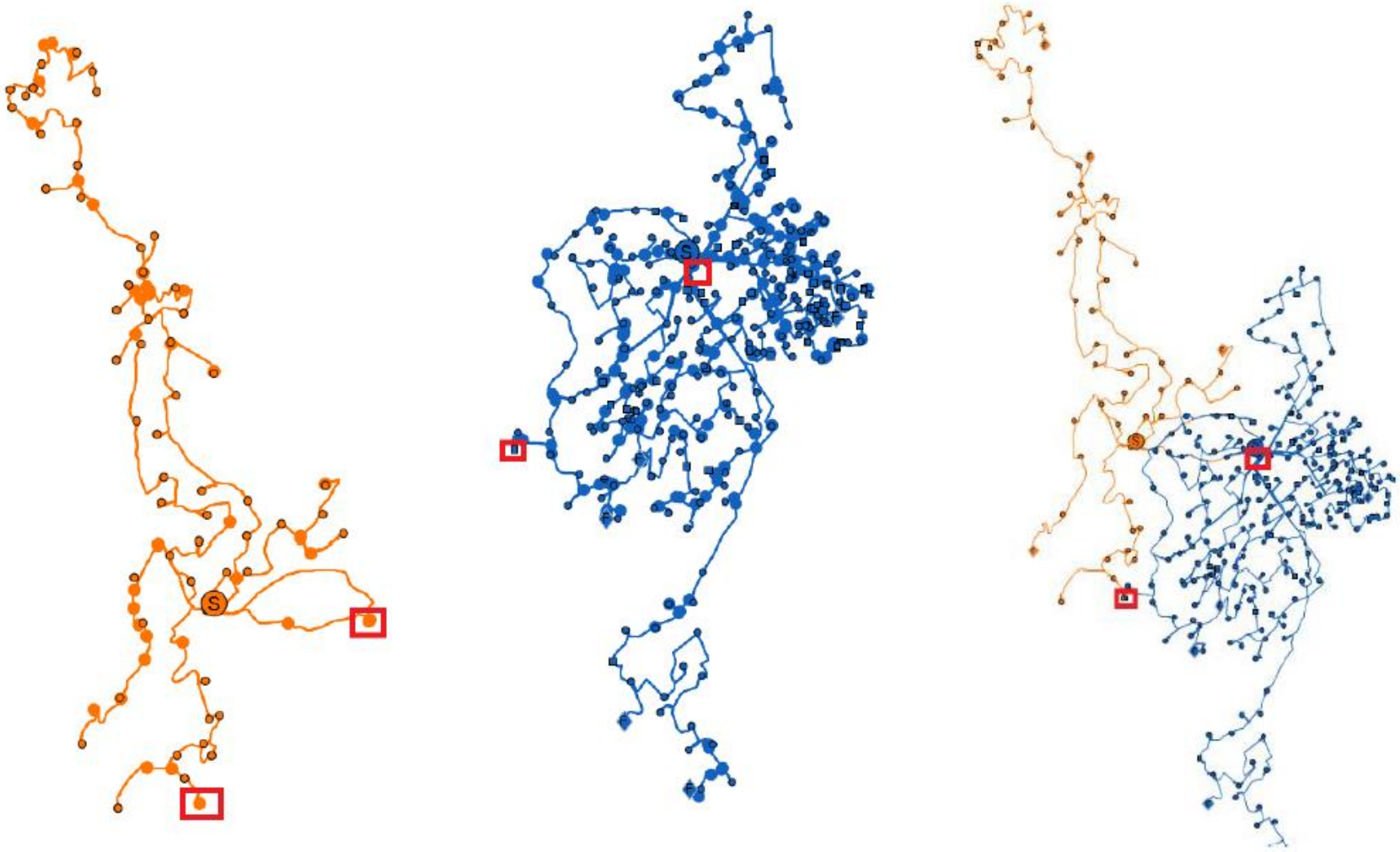
Current data exchange: Excel & PDF

Current state challenges: >200 outages a day



MERGING MODELS

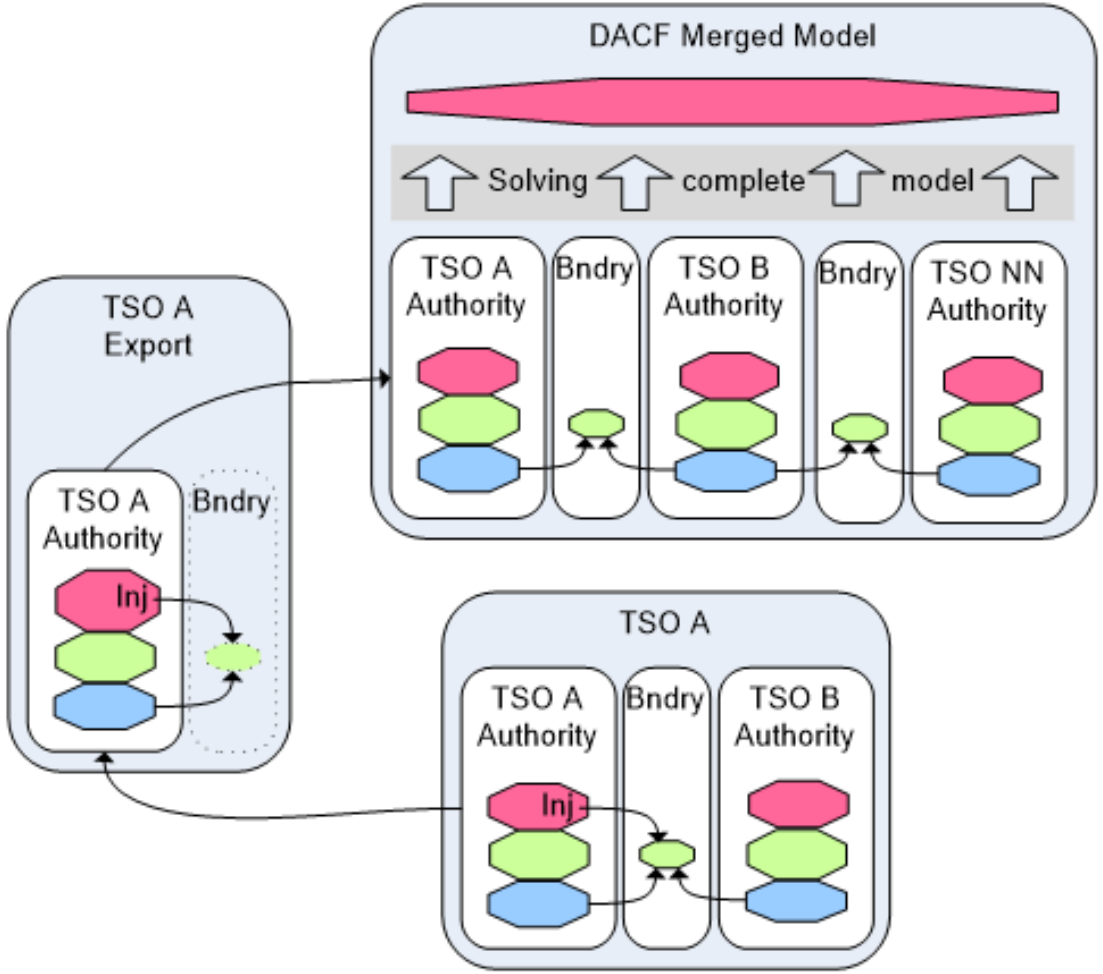
ARUP CATAPULT Energy Systems IB1 Icebreaker One



ESO

Virtual Energy System
Powered by ESO

DACF PROCESS



Virtual Energy System

Powered by ESO

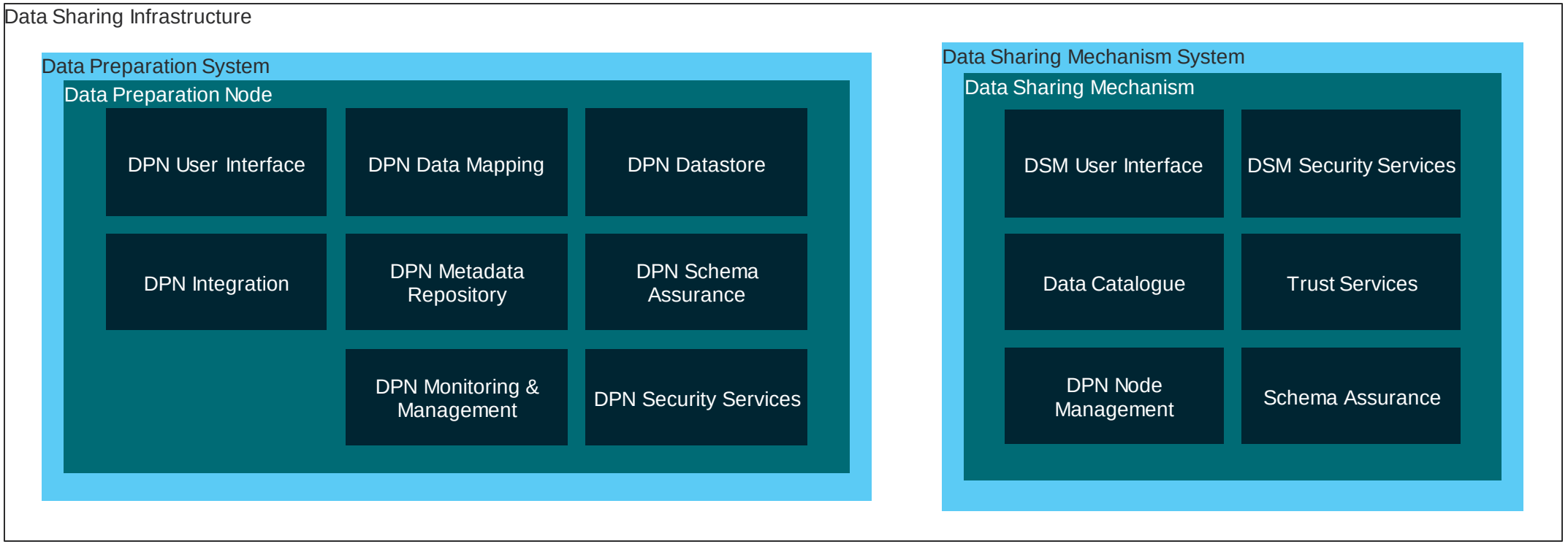
ARUP CATAPULT Energy Systems IB1 Icebreaker One

TECHNICAL ALIGNMENT: NATIONAL DIGITAL TWIN PROGRAMME & VIRTUALES

John Bintu
Solutions Architect, Arup

All questions via Slido
slido.com
Code: #VirtualES

LEVEL 2 APPLICATION ARCHITECTURE

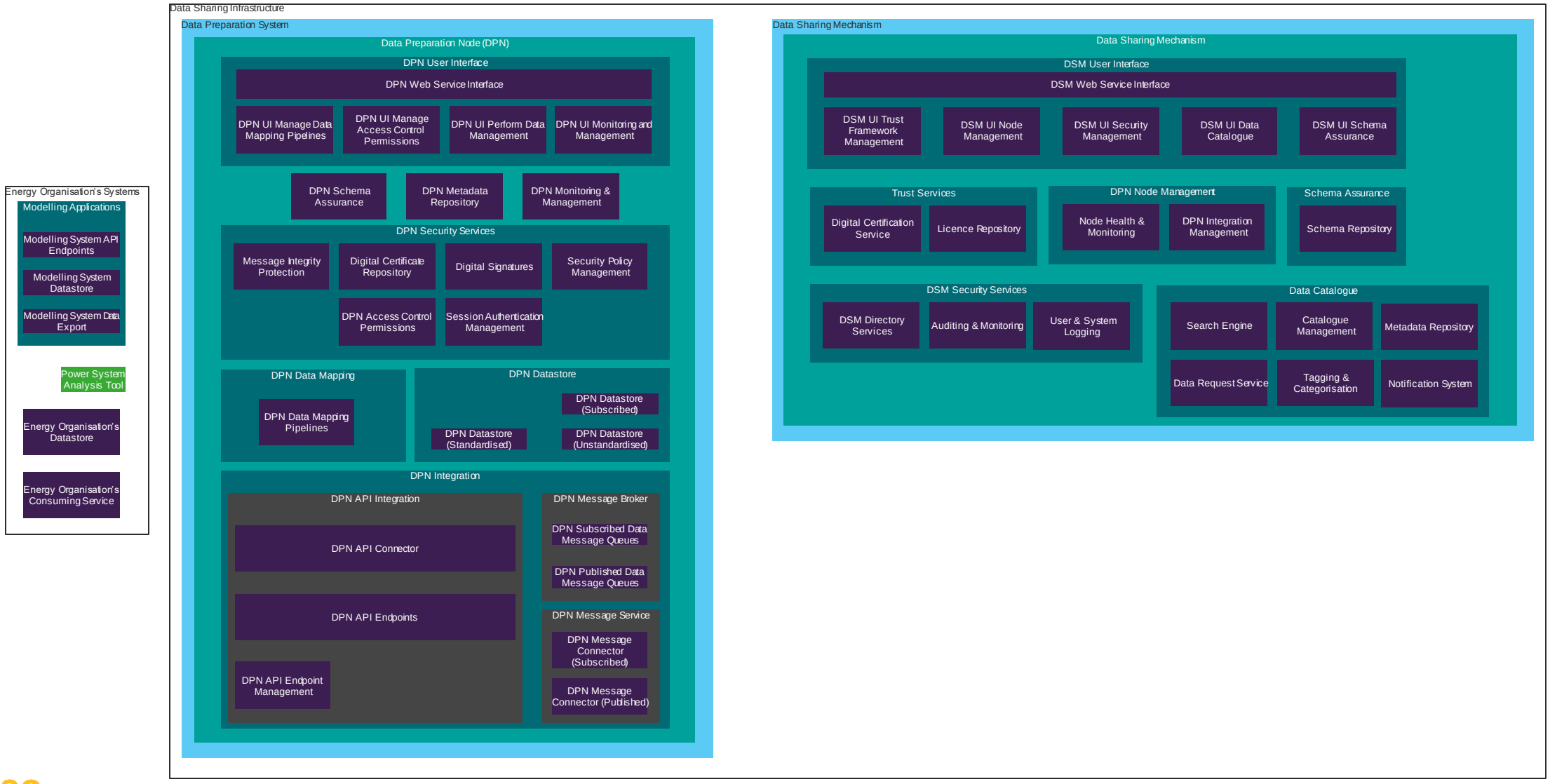


LEVEL 2 APPLICATION ARCHITECTURE

ESO

Virtual Energy System
Powered by ESO

LEVEL 2 APPLICATION ARCHITECTURE



ESO

Virtual Energy System
Powered by ESO

Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

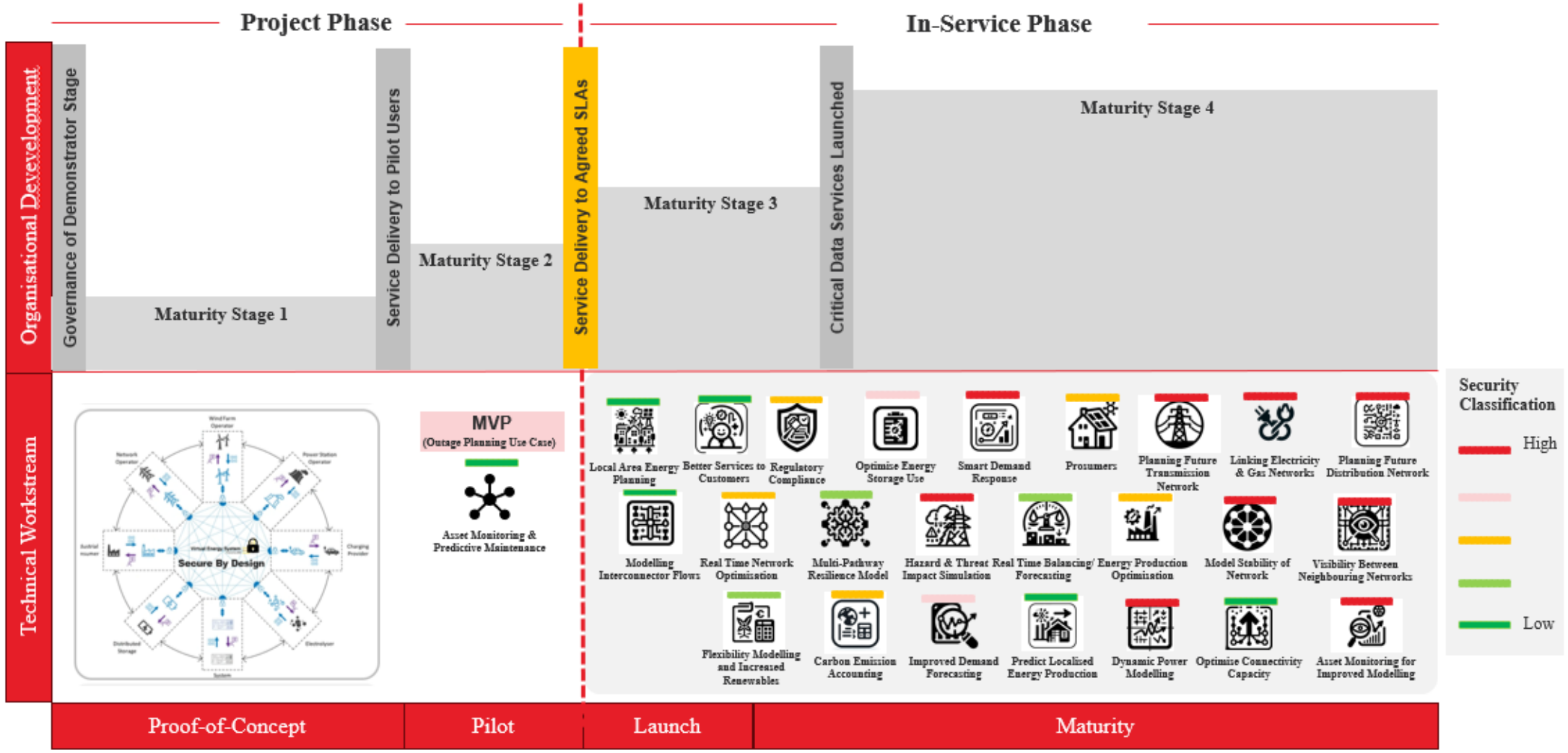
SECURITY

Robert Morgan
Senior Consultant, Arup

All questions via Slido
slido.com
Code: #VirtualES

CYBER: APPROPRIATE AND PROPORTIONAL

ARUP CATAPULT Energy Systems IB1 Icebreaker One

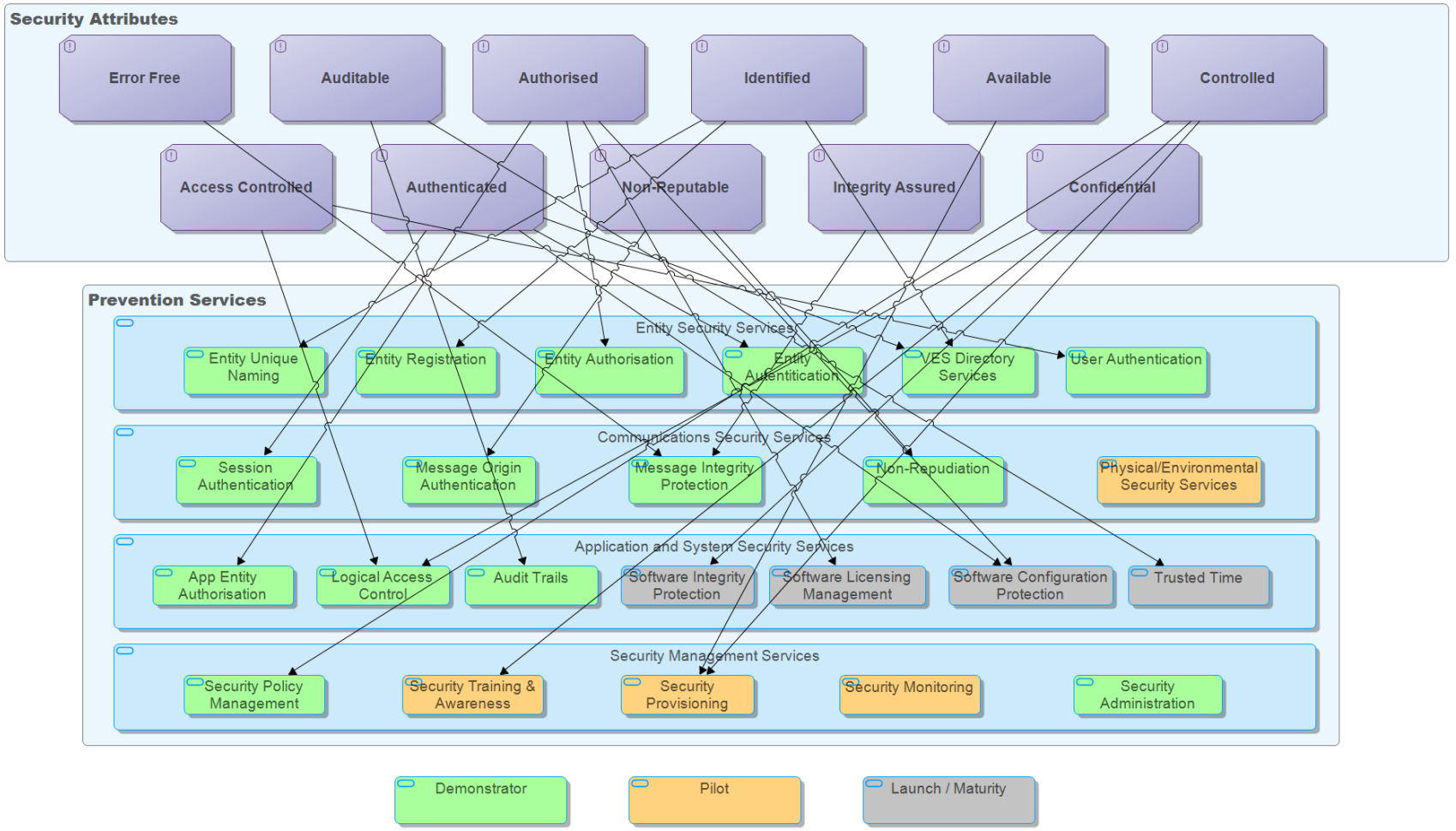


ESO

Virtual Energy System
Powered by ESO

DEFINING THE SECURITY CONTROLS

Outage planning use case



ESO

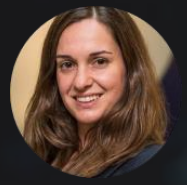
Virtual Energy System
Powered by ESO

Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

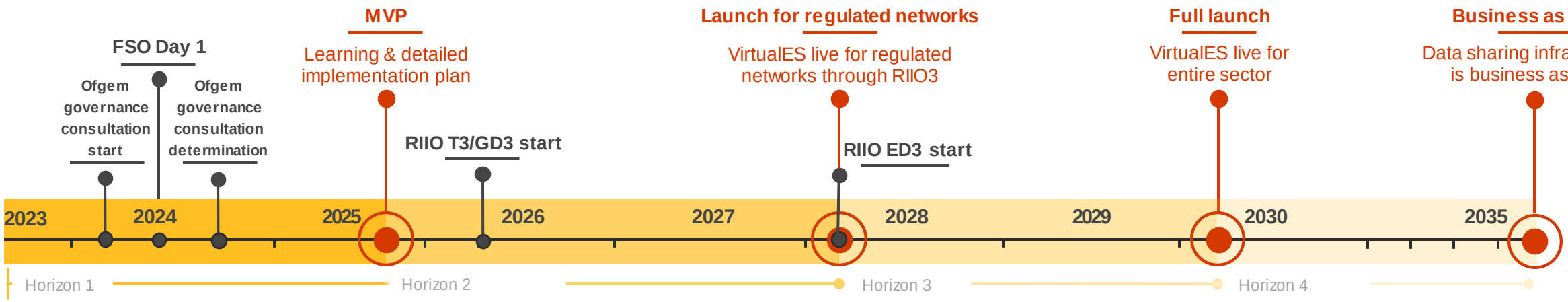
PROGRAMME ROADMAP



Maria Kordoni
Programme Manager, Virtual Energy System

All questions via Slido
slido.com
Code: #VirtualES

HIGH LEVEL ROADMAP (2023 – 2035)



Develop the **detailed design** for data sharing infrastructure

Build & test MVP based on agreed **use case**

Review industry codes, recommend plan for a **'digital and data grid code'** development

Update and evolve design of the data sharing infrastructure based on MVP learning

Build and test the **infrastructure and service model**

Roll out to **early adopters & innovators**

'Digital and data grid code' implemented through the Trust Framework

Implement data sharing infrastructure **governance**

Iterate the solution

Complete roll out to all identified 'day 1' users (RIIO3 organisations)

Progressive roll out to the wider energy sector

Steady state operation and compliance monitoring

New users onboarding

Evolution & continuous improvement

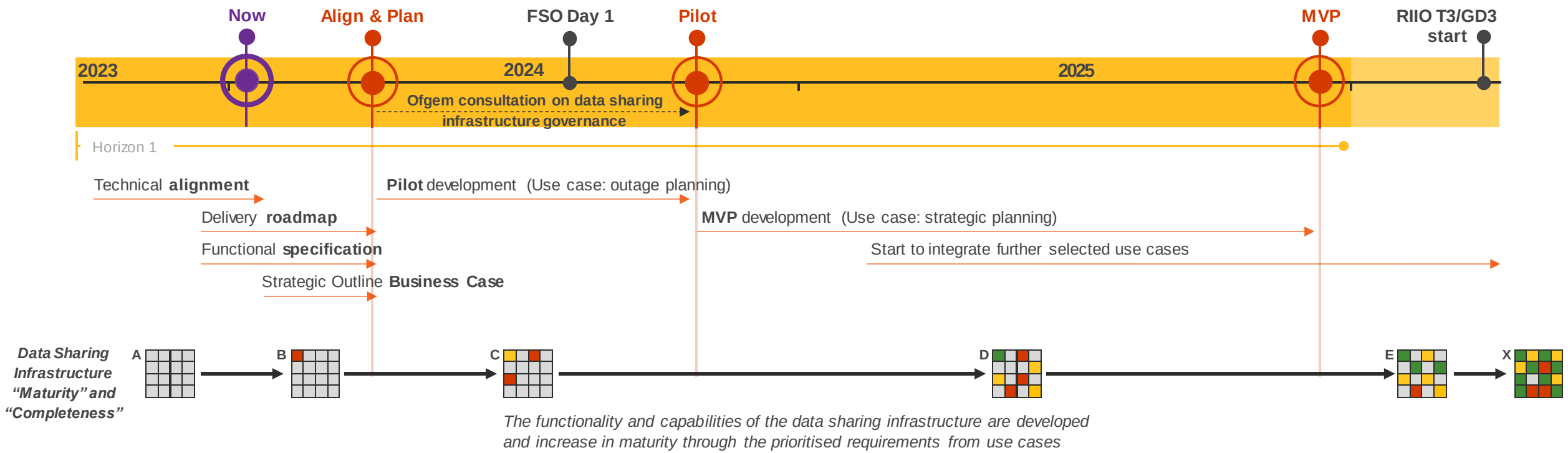
Enablers

- Strategic Outline Business Case
- Full Business Case approved
- Ofgem data sharing governance consultation
- Confirm funding routes
- Ofgem consultation on the MVP and future implementation of data sharing infrastructure
- Incentives for non-regulated markets, using SIF as a mechanism to adopt the digital infrastructure
- Mandate for implementation of 'digital grid code' and use of VirtualES
- Further enablers tbc as programme develops

Notes to reader:

These slides are a snapshot of the work to date on the Virtual Energy System underpinning framework. The intent is to share the evolving knowledge and learnings with industry. This roadmap reflects draft proposals. For more information on the latest developments please contact VirtualES@nationalgrid.com

HIGH LEVEL ROADMAP (TODAY – 2025)



Notes to reader:

These slides are a snapshot of the work to date on the Virtual Energy System underpinning framework. The intent is to share the evolving knowledge and learnings with industry. This roadmap reflects draft proposals. For more information on the latest developments please contact VirtualES@nationalgrid.com

Virtual Energy System

Powered by ESO

ARUP CATAPULT Energy Systems IB1 Icebreaker One

Q&A

Simon Evans

Programme Director, Virtual Energy System

All questions via Slido

slido.com

Code: #VirtualES