Digital Spine

Feasibility study

Developing an energy system data sharing infrastructure

September 2023

Summary presentation

Developed for:

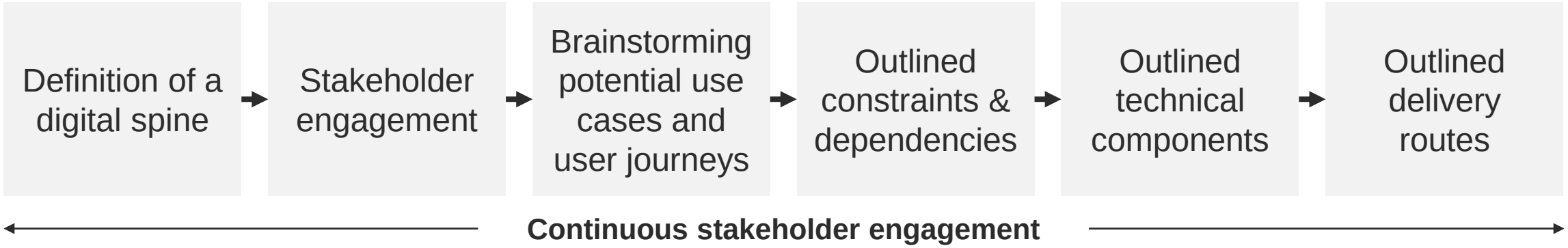
Department for Energy Security & Net Zero

Six-month feasibility study into a “digital spine"

- First outlined by Energy Digitalisation Task Force
- Provides **minimum layer** of digital **infrastructure**, **processes**, and **governance**
- To facilitate **exchange** of energy data in a **secure** and **interoperable** manner
- Data sharing is crucial in achieving net zero at the lower cost to consumers

Feasibility study approach

- Over 100+ cross-sector engagements:
  - Stakeholder-led
  - Collaborative
  - Consultative



Why is it needed?

- Data sharing is crucial in achieving net zero at the lower cost to consumers

Greater value offerings for the customers

Meet UK government policy objectives

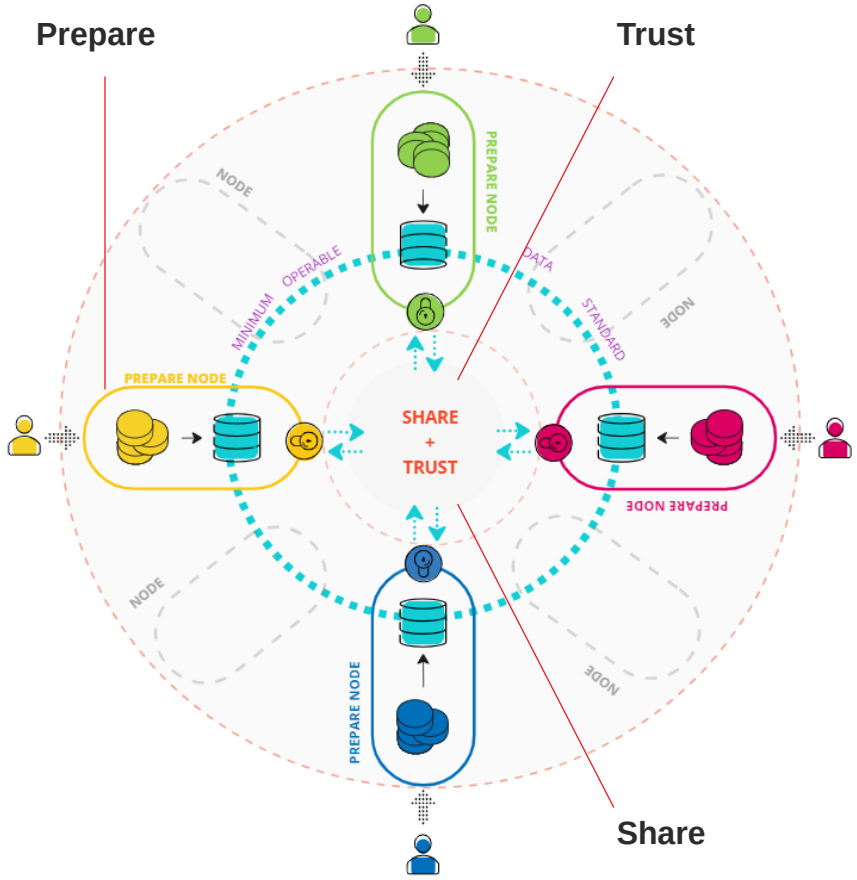
Flexible and stable system

Increased pace of innovation

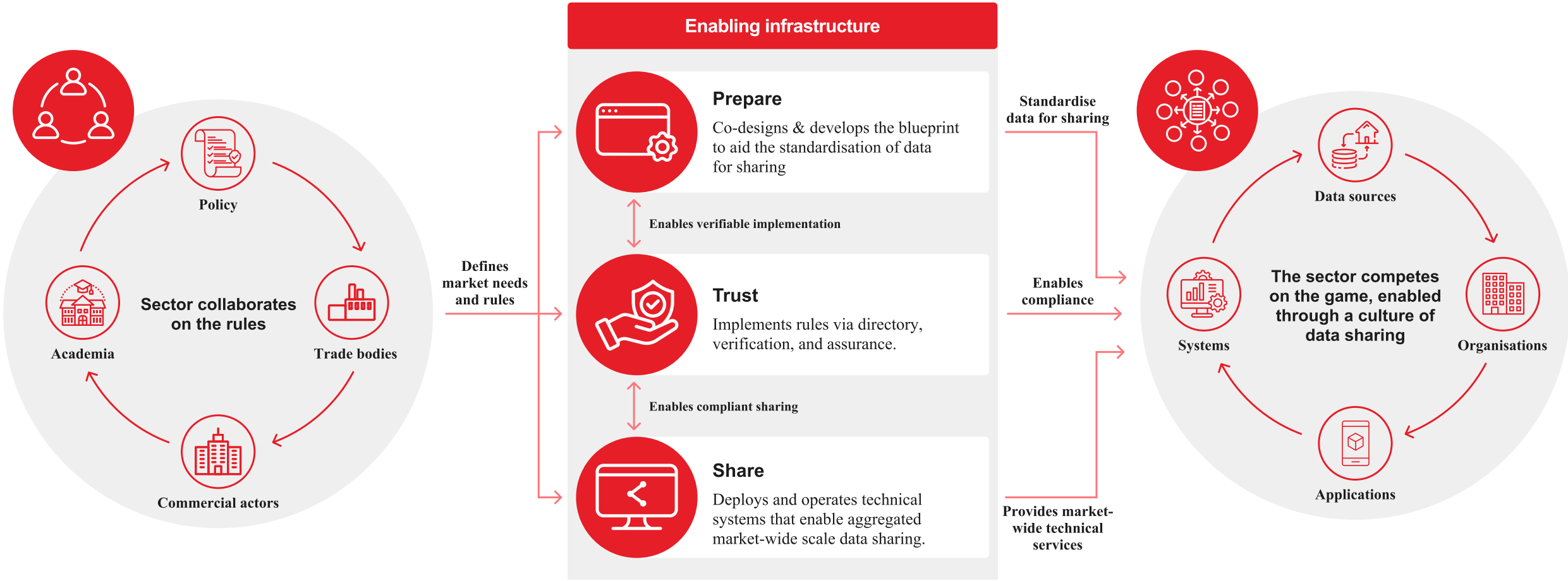
What is the proposed solution?

Proposed solution: data sharing infrastructure

- Reframed the *Digital Spine* and *Data Sharing Fabric* concepts as:
  - **“Data sharing infrastructure”**
- Defined by three functional components:
  - **Prepare:** cross-sector data preparation node
  - **Trust:** sector-wide trust framework
  - **Share:** sector-wide data sharing mechanism

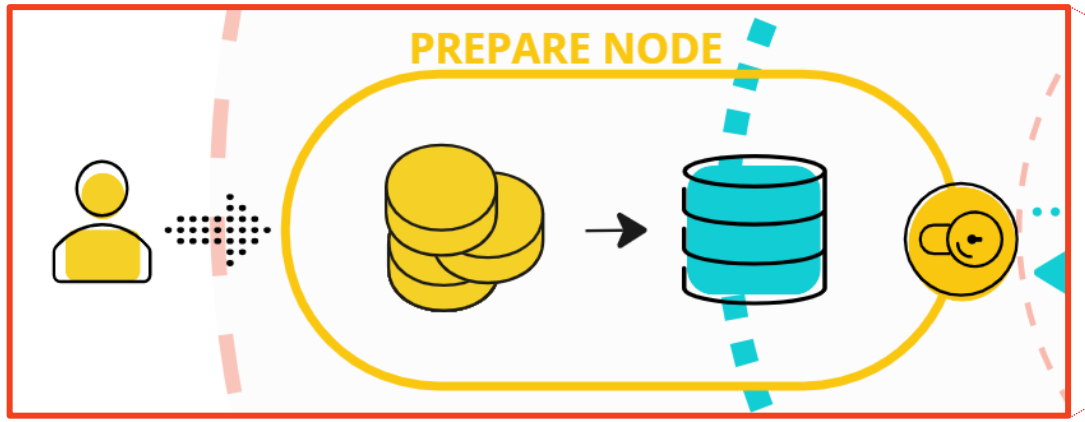


Ecosystem of a data sharing infrastructure



Prepare: a cross-sector data preparation node

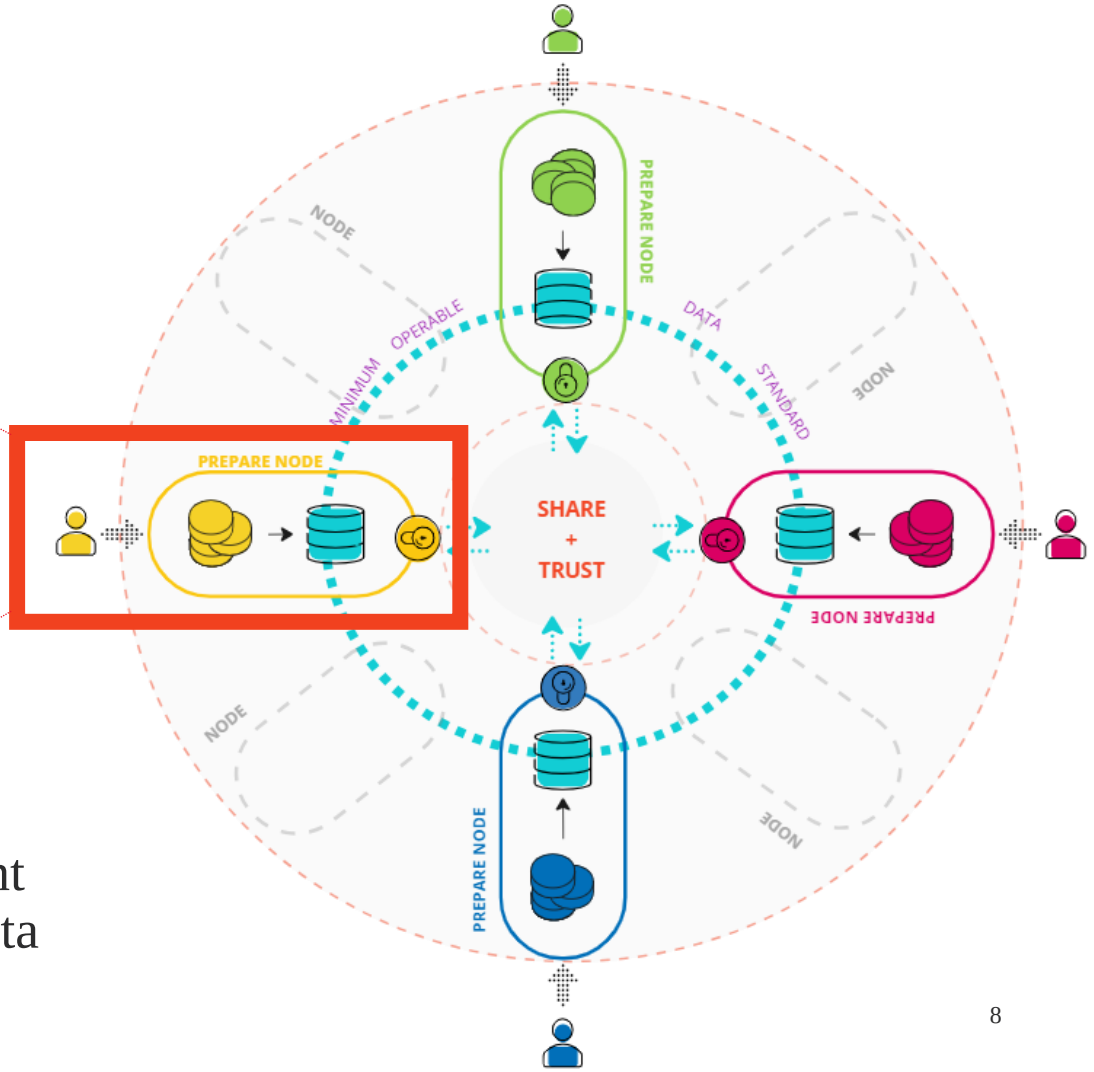
Commonly structured data preparation node on an organisation's own infrastructure



Control & specify data to share

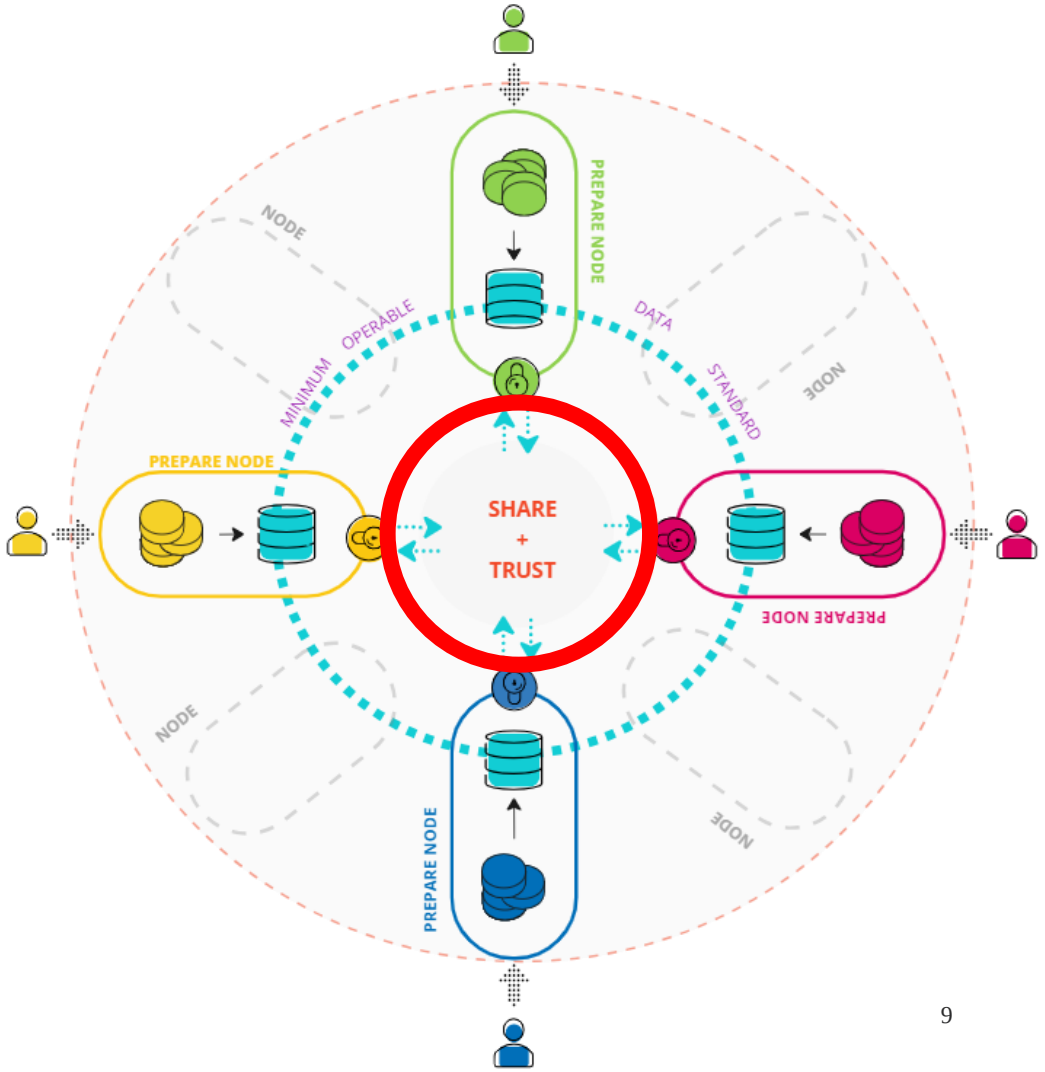
Align data to minimum operable standard

Securely present standardised data through APIs



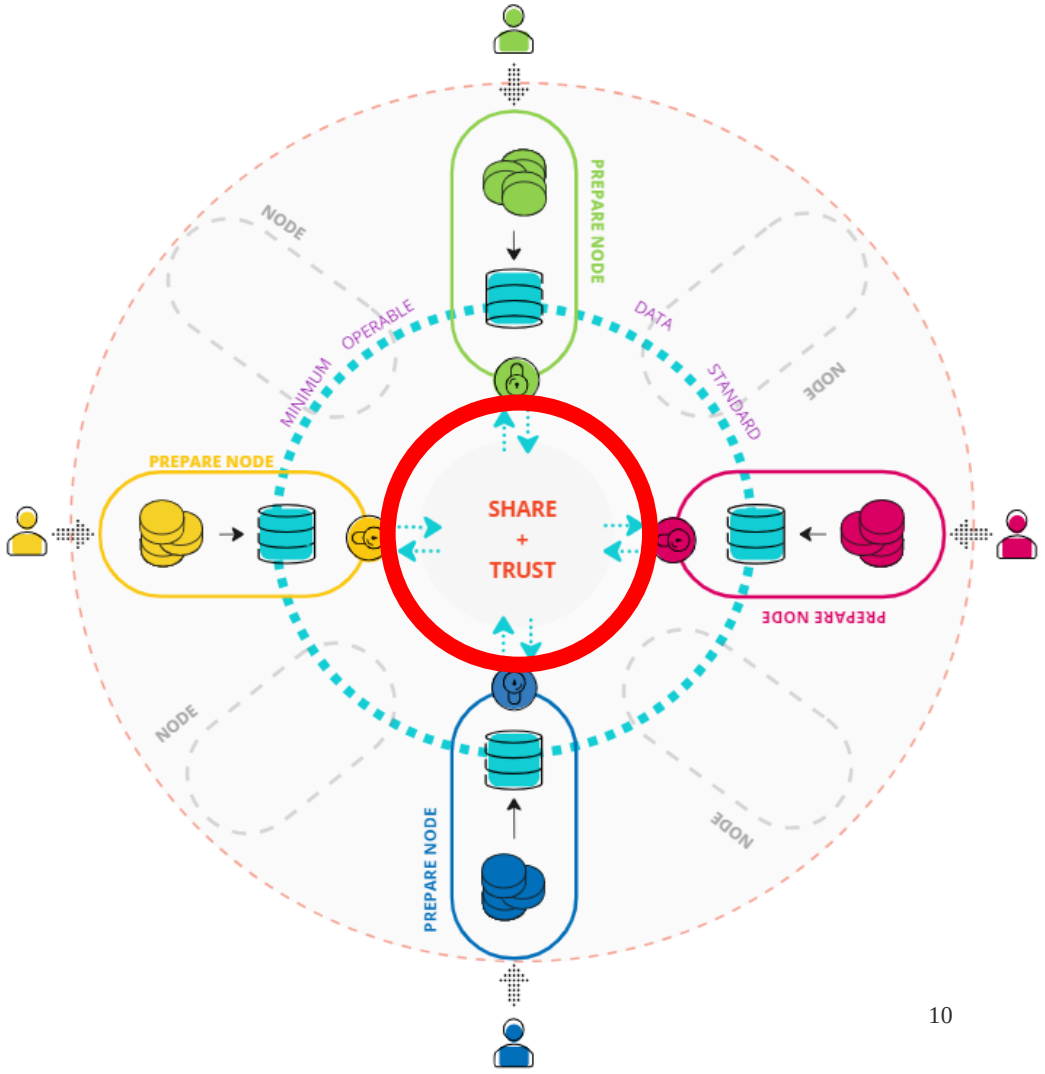
Trust: a sector-wide trust framework

- **Defines, implements** and **governs** the **legal** and **identity rules** that ensure reliable data sharing
- Facilitates:
  - Process of agreeing data sharing rules
  - Integration of process for organisations to implement rules
  - Technical components to codify rules



Share: a sector-wide data sharing mechanism

- **Connectivity layer** and **technological implementation** for the **governance** of access controls to data
- Facilitates:
  - Discover data shared by other actors
  - Securely request & pull data through the data preparation node
  - Governance, and licencing definition/brokerage



Socio-technical characteristics

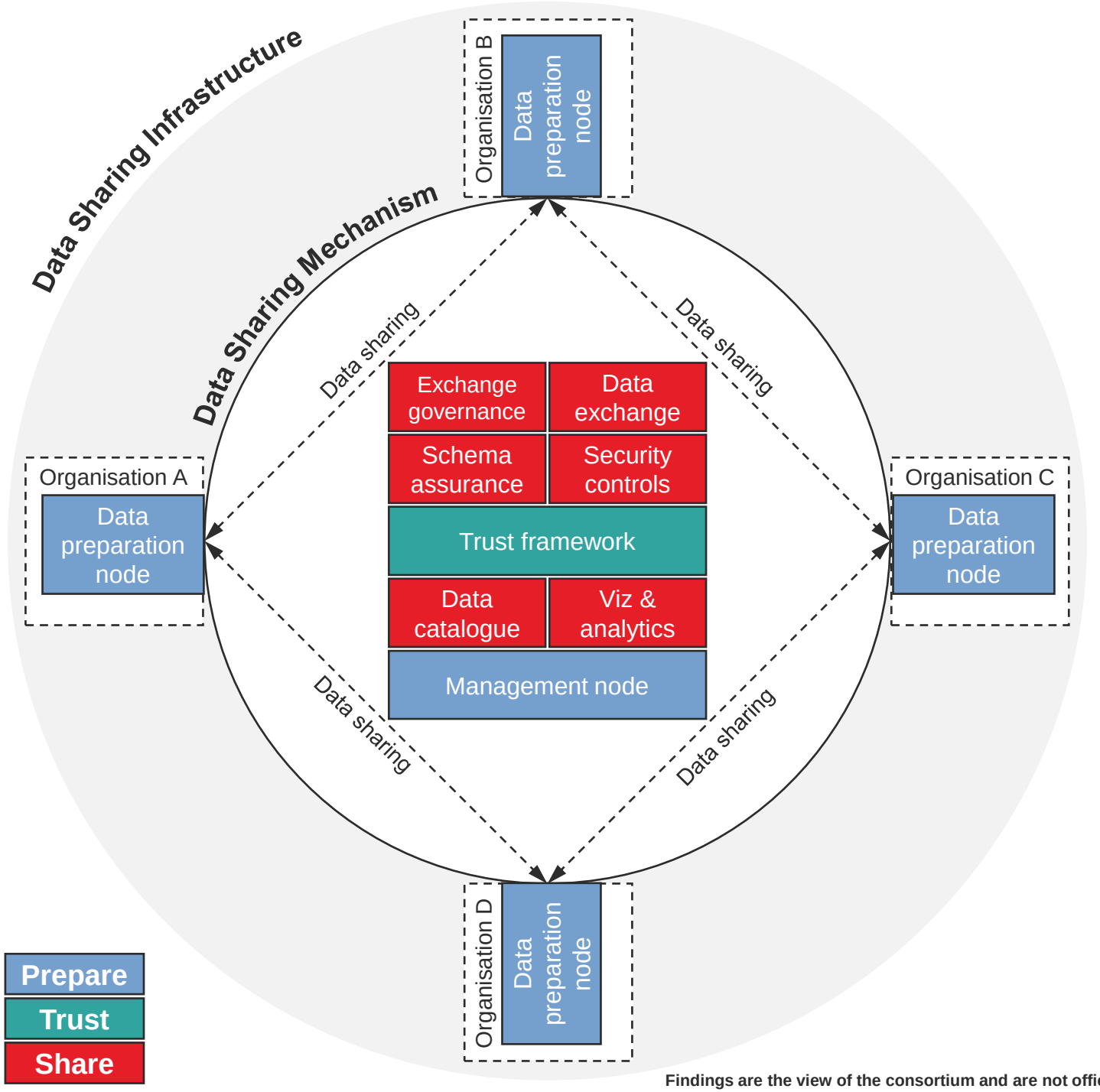
Fostering a culture	**Hybrid architecture**	**Collaborative**
Transparent operations	**Low barrier deployment**	**Use case driven**
Data standardisation & interoperability	**Hybrid technology stack**	**Secure**
Self-serve platform	**Reliable and performant**	**Low integration overhead**

Prioritised use cases

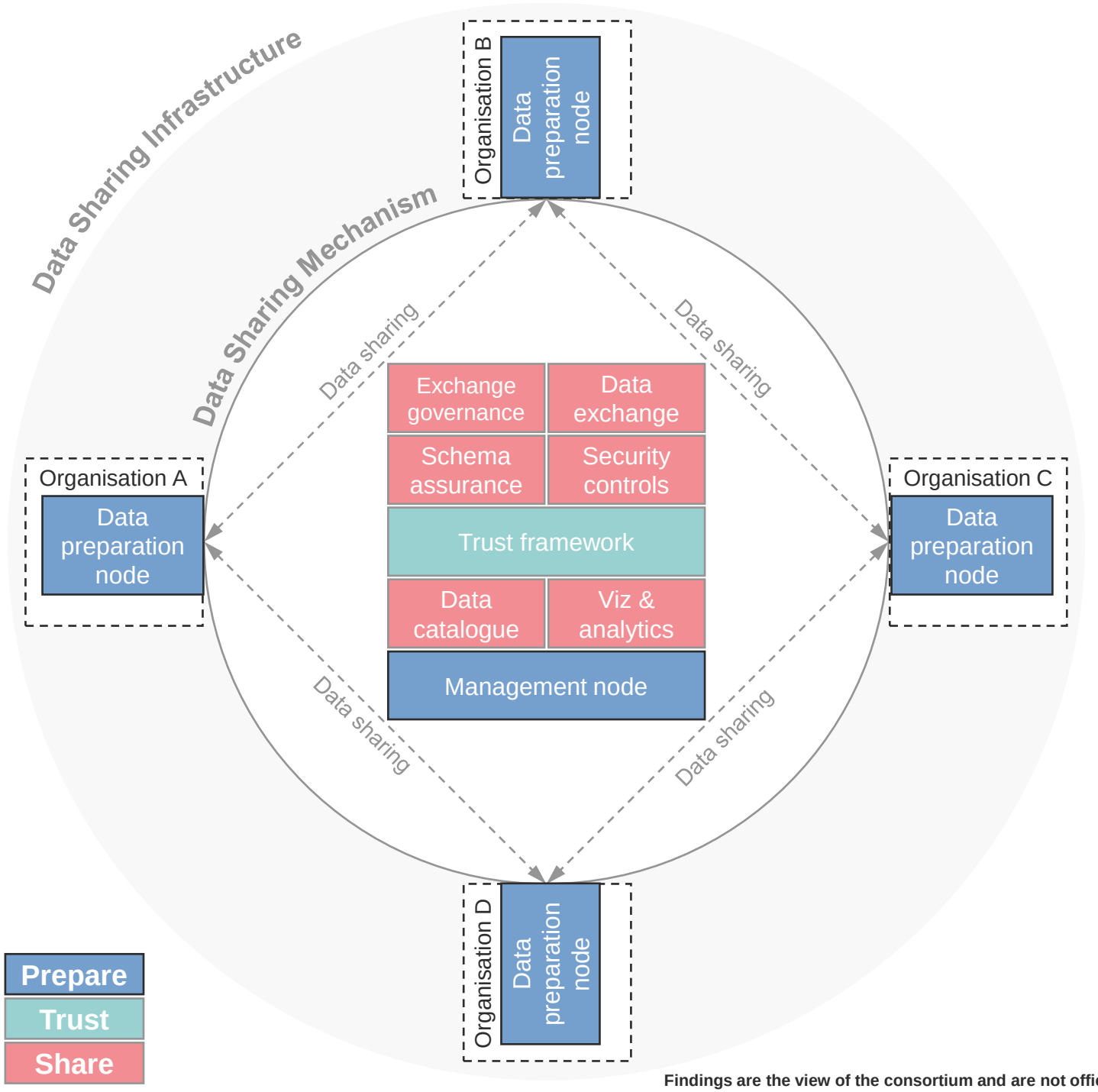
- 15 potential use cases identified through research and stakeholder engagement
- 5 use cases prioritised:
  - **Day 1 use cases:** provide immediate value
  - **Strategic use cases:** provide future strategic potential
- Used to determine MVP functional requirements

Type	Use case name	Use case goal
Day 1	Vulnerable consumer identification	Provide holistic and up-to-date view of vulnerability. Ensure secure access to enable different parties to take appropriate actions
Day 1	LAEP & coordination of local decarbonisation planning	Enable easier coordination of local decarbonisation planning and actions
Day 1	Electricity flexibility	Improve timely exchange of information to better understand, use and incentivise the reliance on and provision of flexible assets
Strategic	Electricity market reforms - nodal pricing	Enable exchange of data needed to test the potential working of a future nodal market structure
Strategic	Sector coupling	Enable better forecast of demand for flexibility over time to integrate different energy vectors

Technical components of a data sharing infrastructure

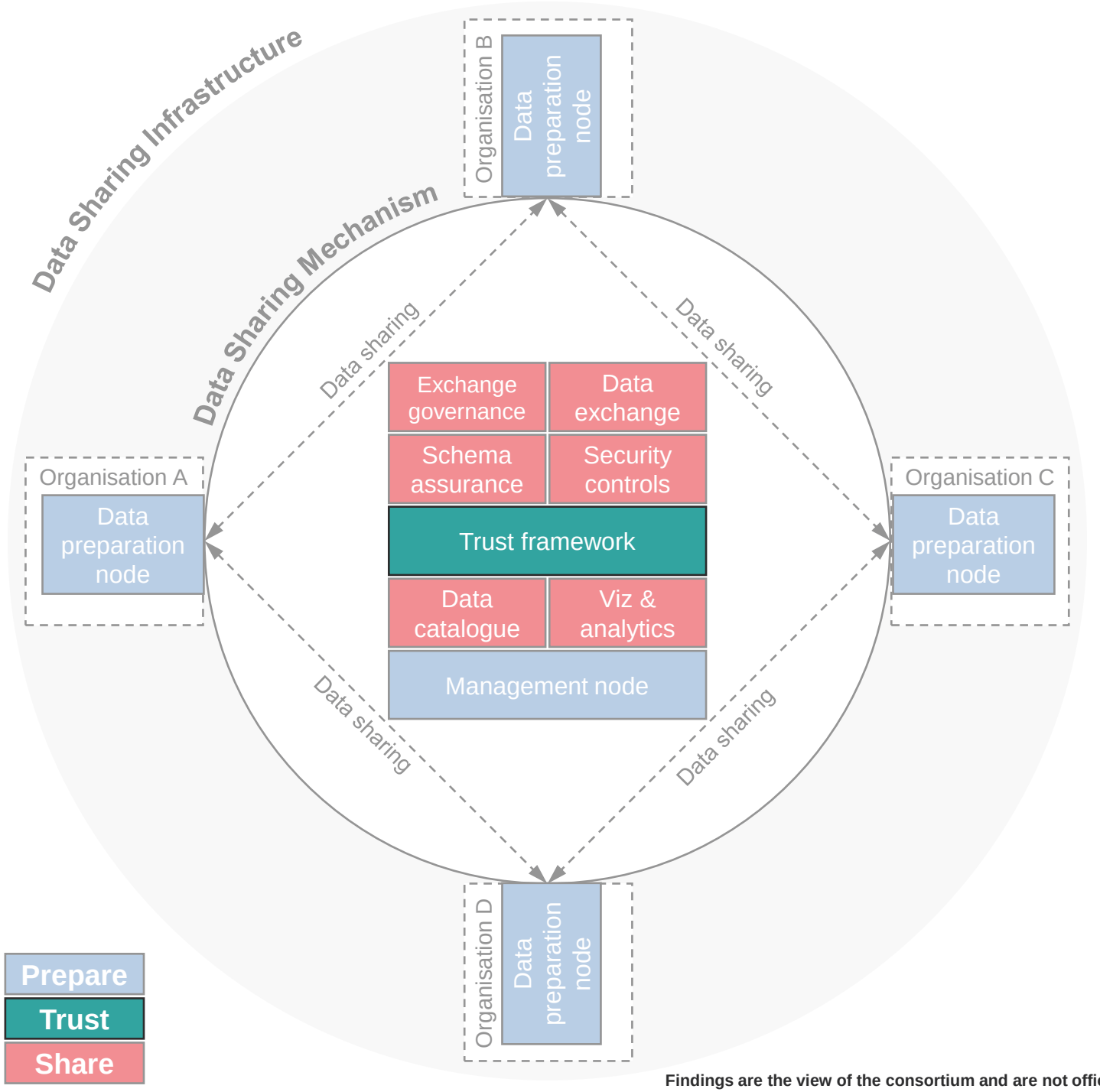


1. **Prepare:** A cross-sector data preparation node
   *(previously the **Digital Spine**)*
2. **Trust:** A sector-wide trust framework
3. **Share:** A sector-wide data sharing mechanism
   *(previously the **Data Sharing Fabric**)*



Prepare

- **Cross-sector** data preparation node
- **Open-source** systems architecture up to an API endpoint.
- This includes:
  - The **toolkit** that supports the preparing of organisational data to consistent standards for sharing
  - The assignment of **data handling conditions**
  - The **API endpoint** at the organisational boundary



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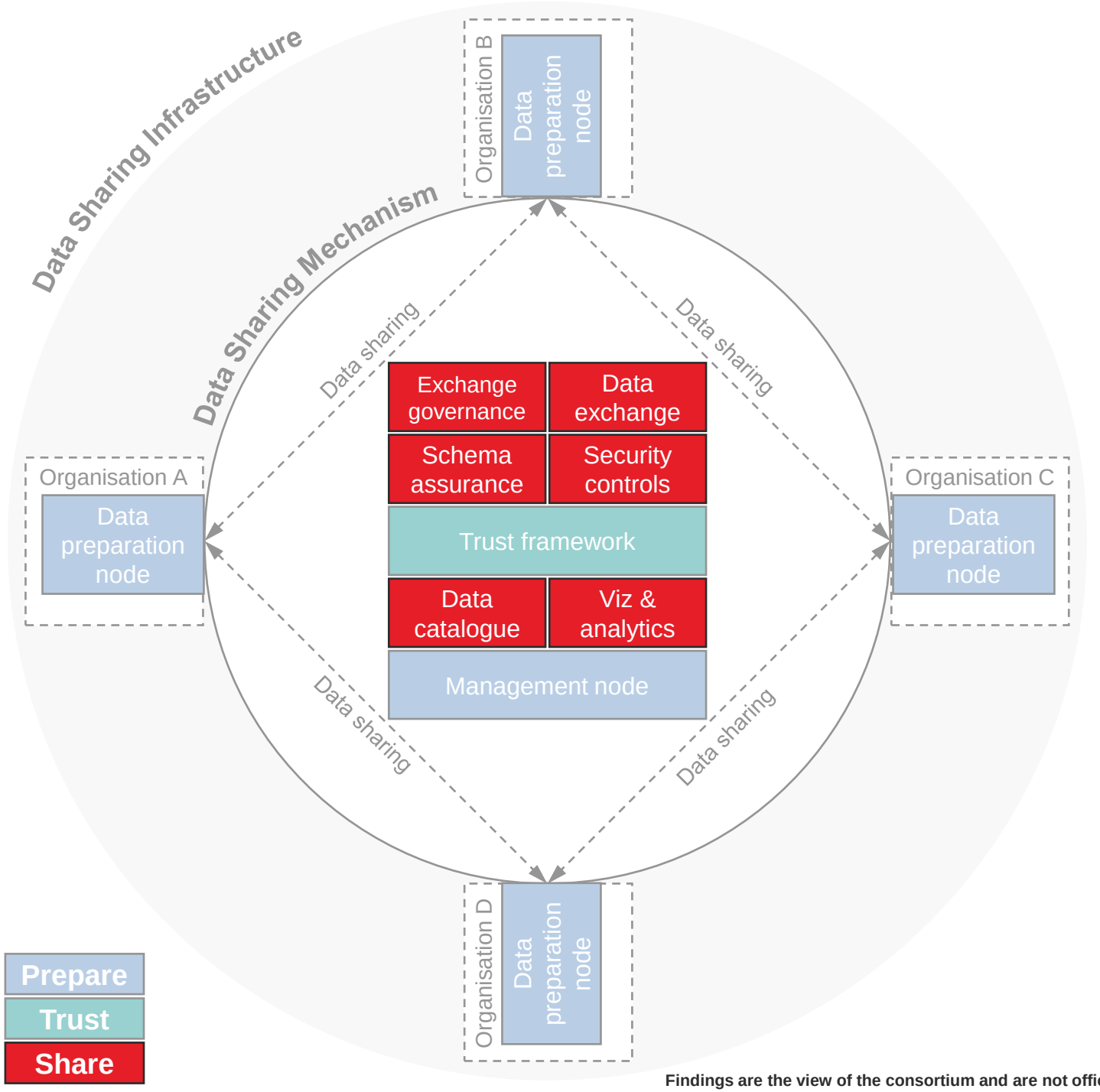
Trust

- **Sector-wide** trust framework
- Provides the definition, implementation, and governance of the legal and identity frameworks
- This includes:
  - The **process** of agreeing rules for data sharing in the data sharing mechanism, and;
  - An **integration of process** for enabling organisations to participate through a data sharing mechanism that can implement those rules.



Prepare

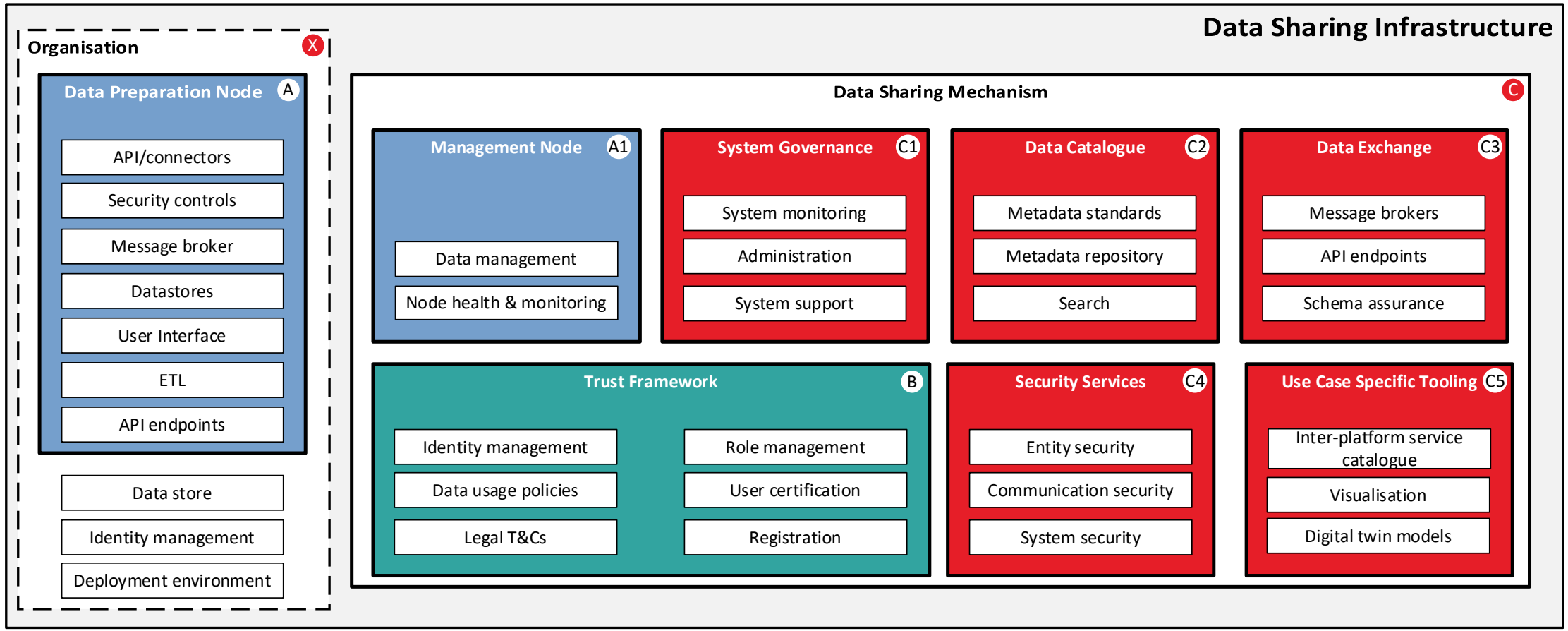
Trust

Share

Share

- **Sector-wide** data sharing mechanism
- This includes:
  - The **common technical infrastructure** that technically facilitates the secure and resilient transmission of any data between actors
  - The **process** and **service** supporting the systems governance to implement, manage, and maintain the infrastructure

Functional components of data sharing infrastructure



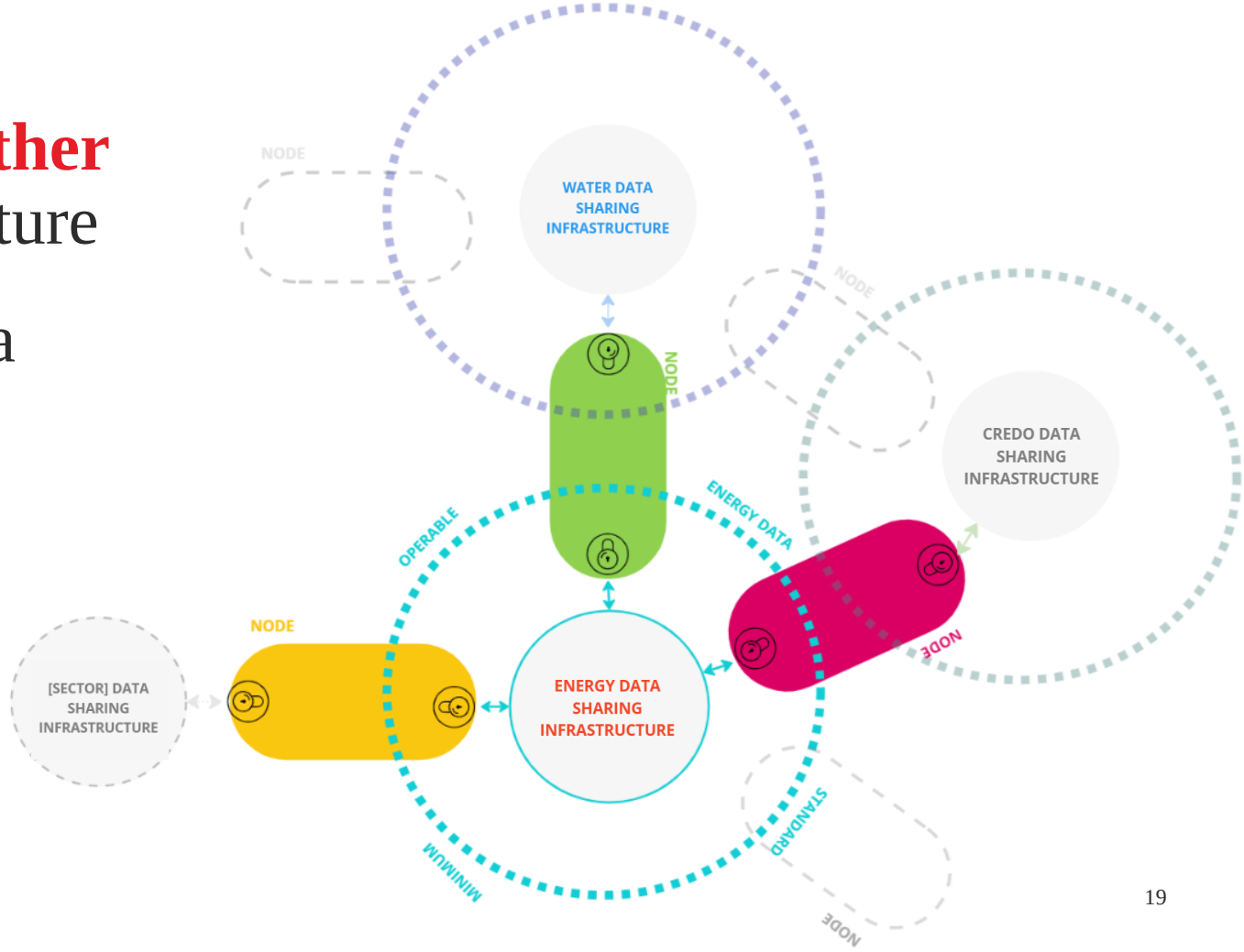
Prepare

Trust

Share

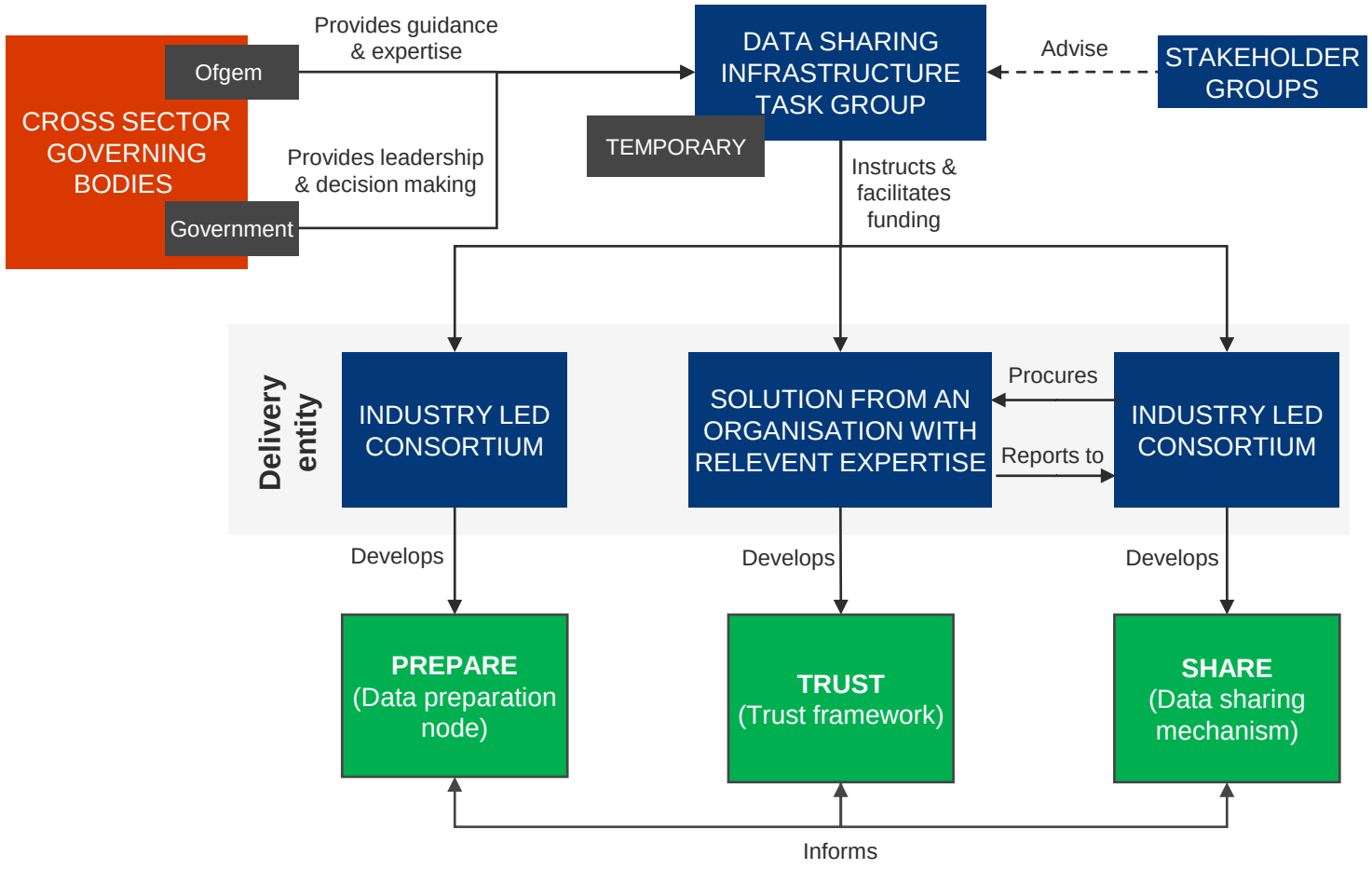
Cross-sector data sharing ecosystem

- Energy system data sharing infrastructure can **connect to other sector's** data sharing infrastructure
- Distributed implementation of a consistent cross-sector **data preparation node**
- Allows organisation to share across multiple data sharing mechanisms



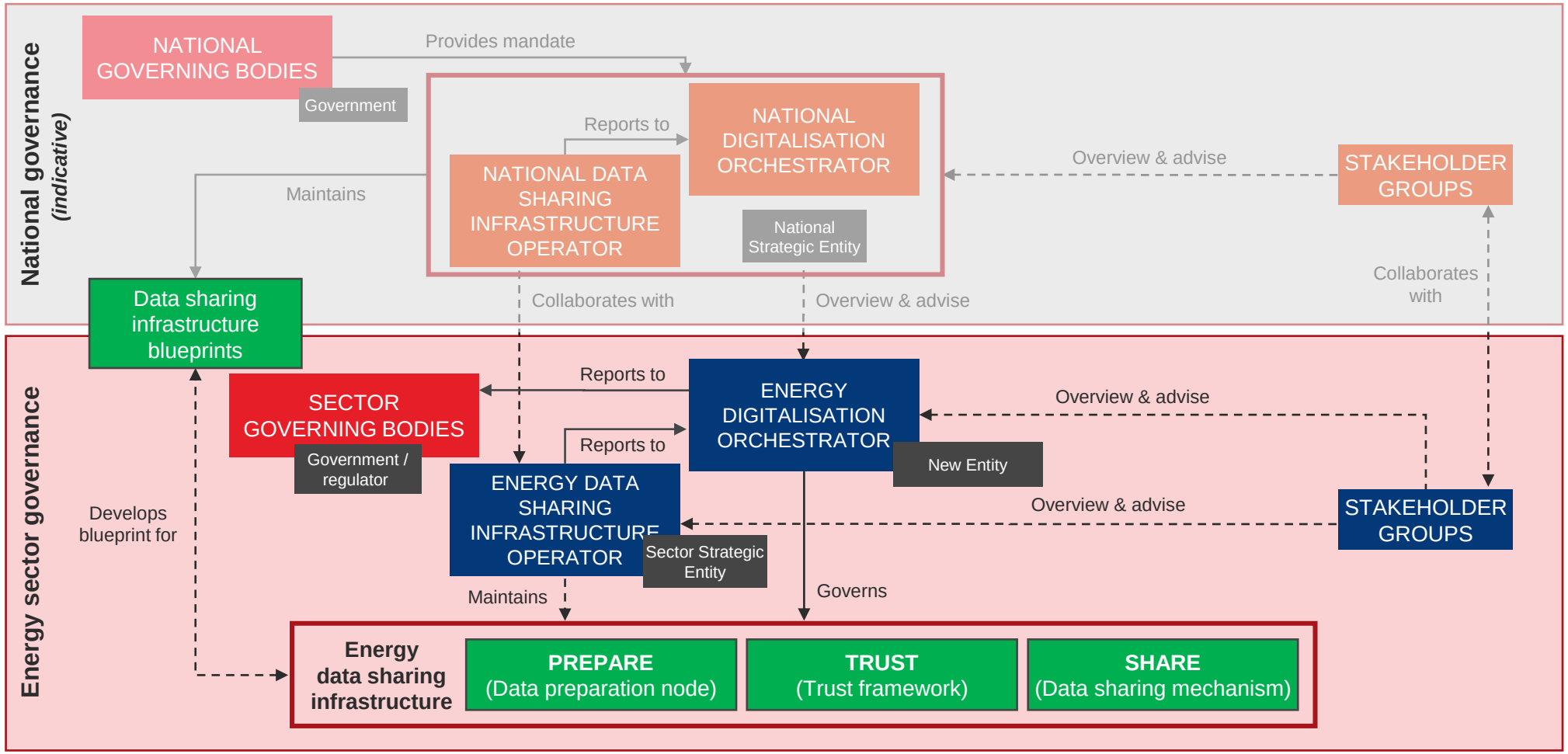
Governance of a data sharing infrastructure

Implementation phase governance (2024-2026)



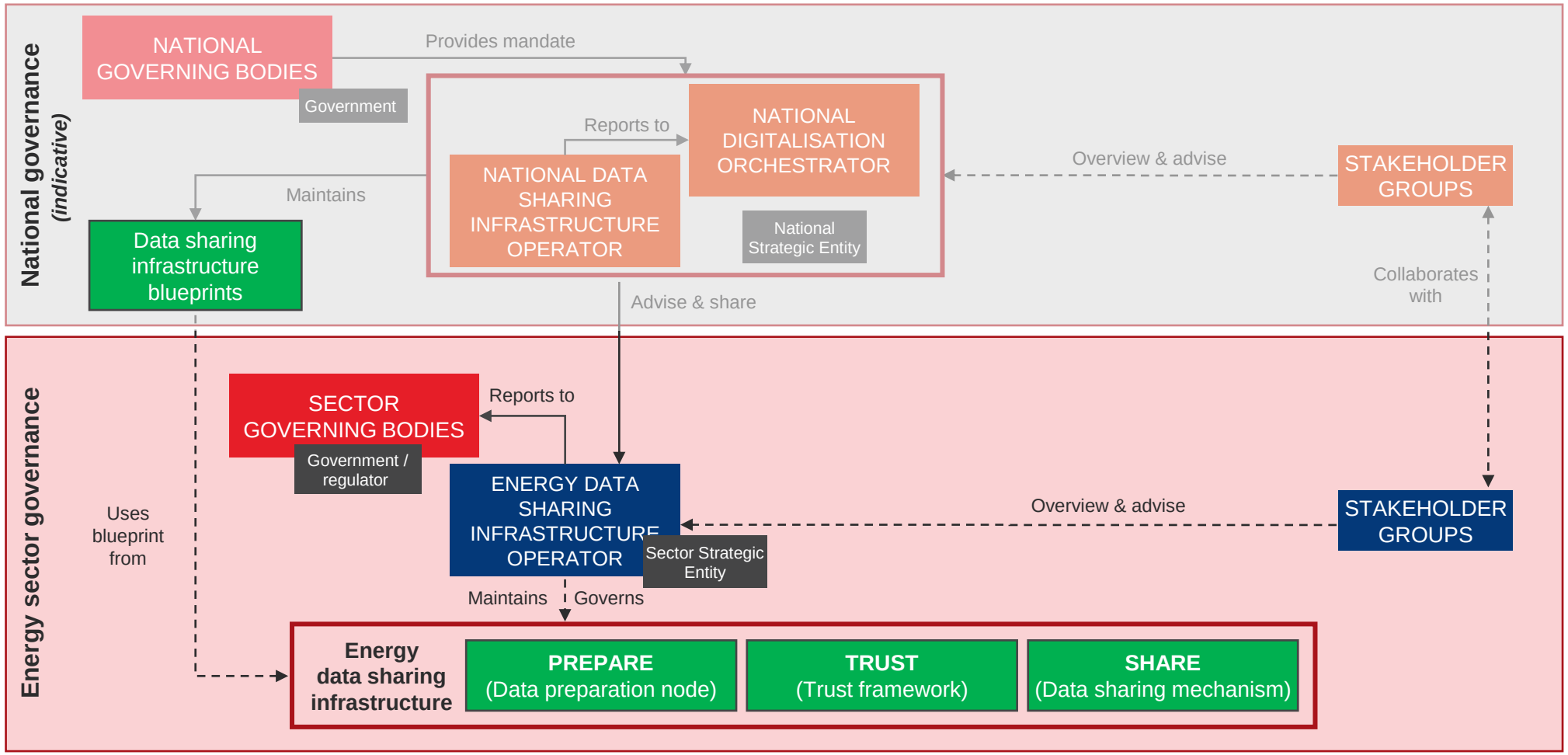
Interim-state operation phase (2026-2030)

Indicative national level governance is included for explanation purposes only. Design of this level is outside of scope



Steady-state operation phase (2030+)

Indicative national level governance is included for explanation purposes only. Design of this level is outside of scope



Route to enabling a data sharing infrastructure

Pathways & routes for enabling delivery

- **Pathways:**
  - Defined as a selection of options for the implementation and steady-state phases for the data sharing infrastructure
  - Additional considerations are required to assess viability:
    - Build or Buy
    - Public or Private
    - Open or Proprietary
- **Routes:**
  - Defined as selection of a pathway, a governance structure, and review of existing related programmes
  - Two categories of routes:
    - **National and sector specific** programme alignment
    - **Sector specific procurement** of relevant capabilities required

Delivery pathways of a data sharing infrastructure

- **Implementation phase:** requirements gathering and analysis, design and development, testing and quality assurance, and deployment.

Option 1A: Independently-led industry consortium	**Option 1B:** Publicly-led development	**Option 1C:** Technology provider builds it	**Option 1D:** Directly procure an existing solution/service

- **Steady-state operation phase:** maintenance and support activities to ensure the functional component operates smoothly

Option 2A: Solution given to an energy sector strategic entity	**Option 2B:** Solution given to a national-level strategic entity	**Option 2C:** Solution given to an energy sector operational entity	**Option 2D:** Commercial agreement to support	**Option 2E:** Solution owned and operated by a private entity

Potential MVP delivery routes

- **National & sector specific programme alignment:**

Route 1A:
Government encourages alignment of on-going programmes

Route 1B:
Government assigns staff to ensure alignment of on-going programmes

Route 1C:
Government assembles a “tiger-team” to align programmes to define long-term governance

- **Sector-specific procurement of capabilities required to deliver MVP:**

Route 2A:
Government procures a data sharing infrastructure

Route 2B:
Government mandates a sector strategic entity to build a data sharing infrastructure

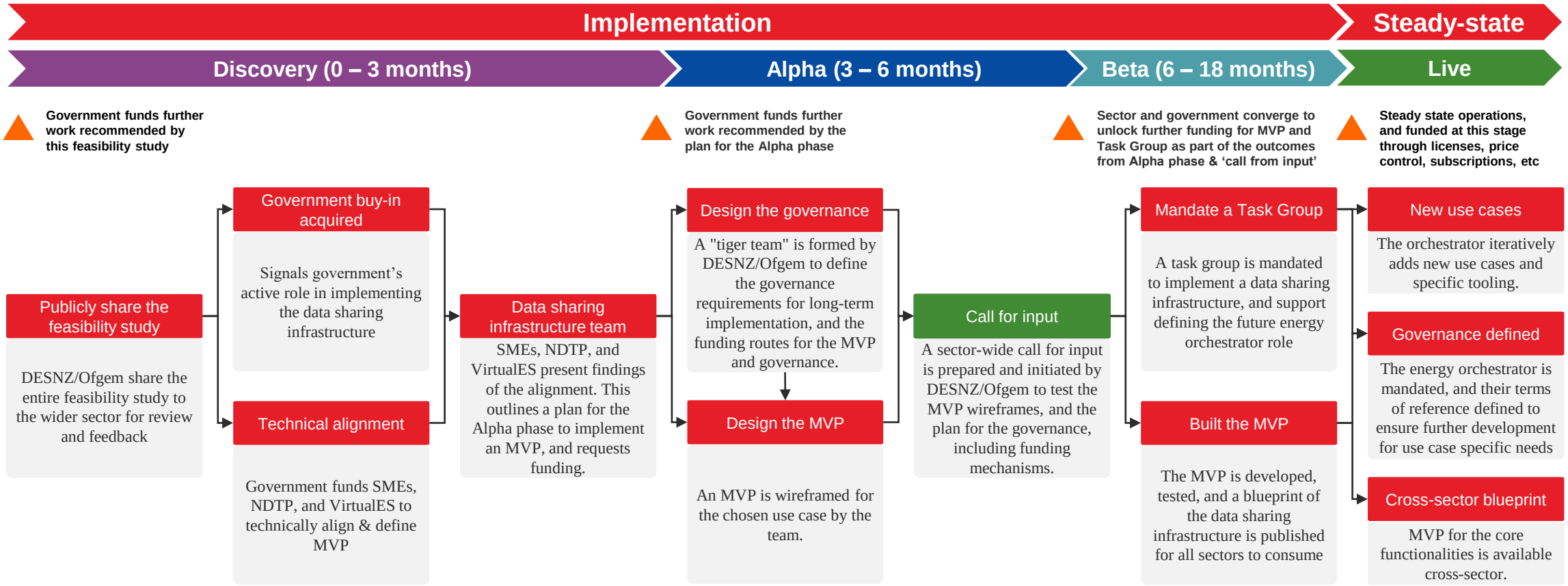
Route 2C:
Government assembles “tiger team” to support implementation & long-term operations

Proposed next steps

Recommendations to accelerate development

- **Clarity from government:**
  - DESNZ & Ofgem to publish statement of how a data sharing infrastructure will be developed and adopted by the sector
- **Develop an MVP:**
  - Government support a development project where the MVP of a data sharing infrastructure is developed, built, and tested
- **Establish a task group:**
  - DESNZ & Ofgem to convene and provide a clear mandate and funding to a data sharing infrastructure task group

Timelines for recommendations



Area of future work

Development of technical components

Security framework

Integration of existing initiatives

Data sharing infrastructure task group

Detailed analysis of delivery and governance

Foster a culture of data sharing

Trust framework

Knowledge dissemination activities

Data sharing infrastructure detailed blueprints

Management of standards

Detail review of licenses, codes, and legislation

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Findings are the view of the consortium and are not official government policy