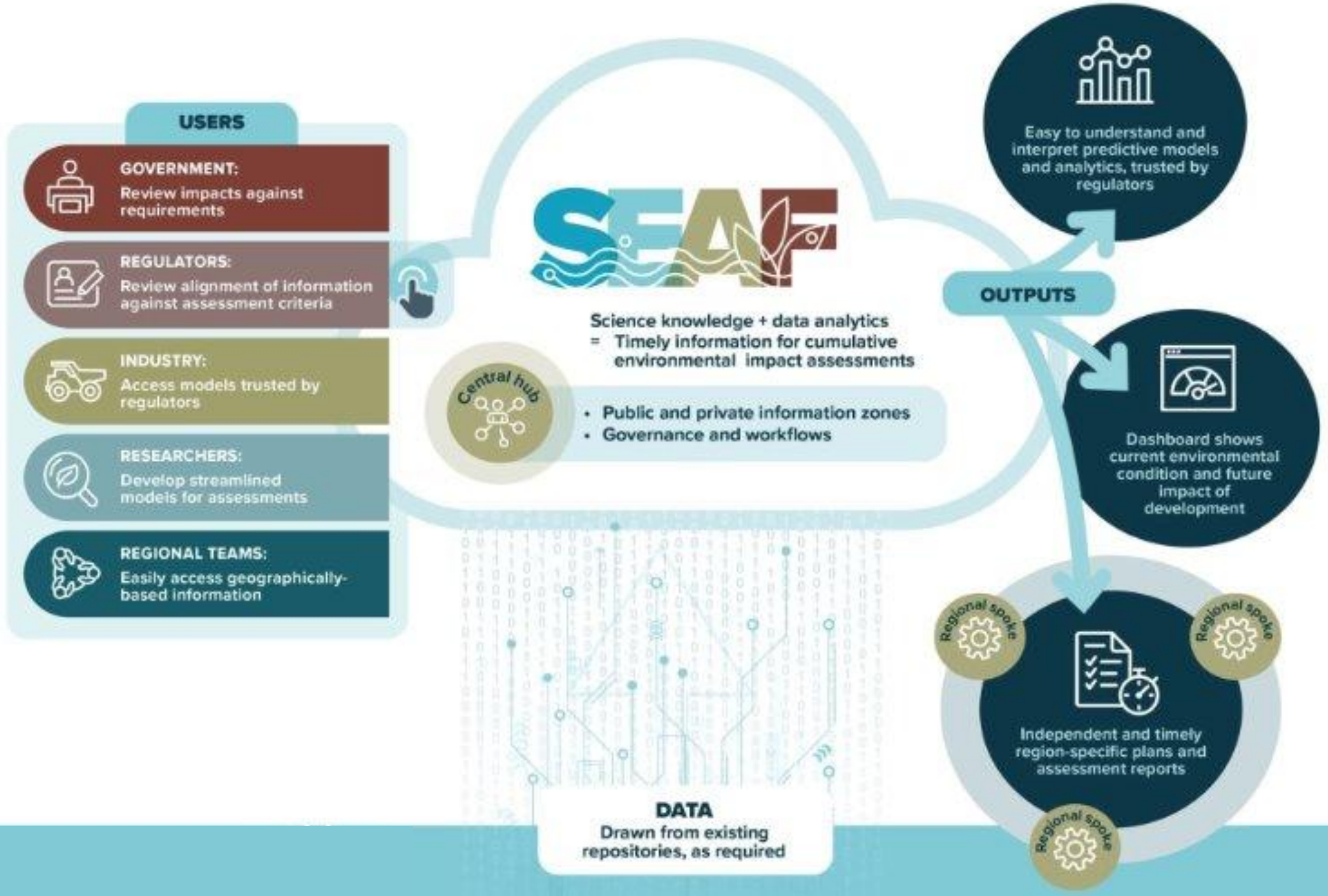
SEAF and the Promise of International Data Spaces

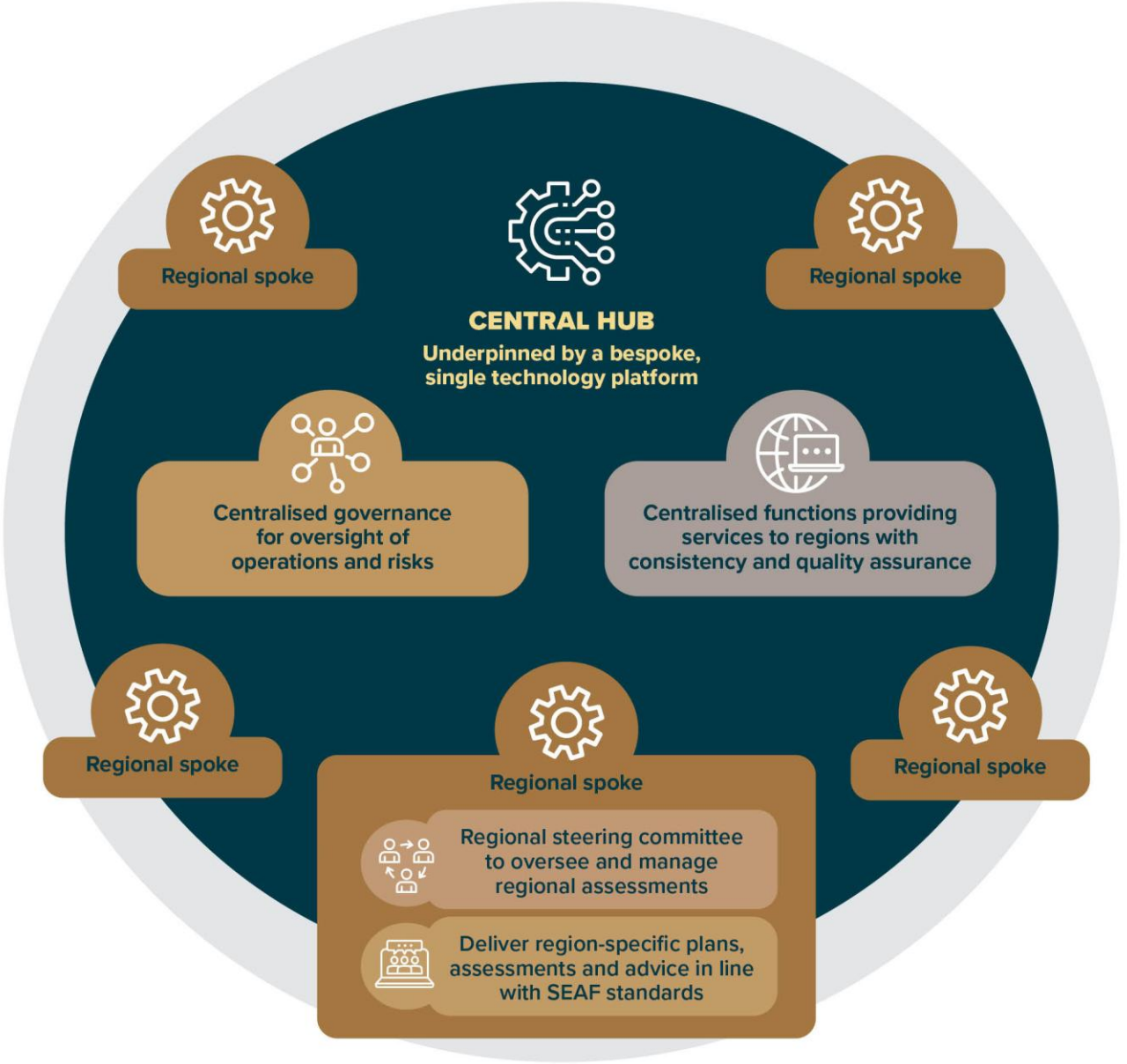
eResearch Australasia 2025

A SHARED ENVIRONMENTAL ANALYTICS FACILITY (SEAF)


USERS
GOVERNMENT:
Review impacts against requirements
REGULATORS:
Review alignment of information against assessment criteria
INDUSTRY:
Access models trusted by regulators
RESEARCHERS:
Develop streamlined models for assessments
REGIONAL TEAMS:
Easily access geographically-based information
SEAF
Science knowledge + data analytics
= Timely information for cumulative environmental impact assessments
Central hub
• Public and private information zones
• Governance and workflows
DATA
Drawn from existing repositories, as required
OUTPUTS
Easy to understand and interpret predictive models and analytics, trusted by regulators
Dashboard shows current environmental condition and future impact of development
Regional spoke
Regional spoke
Regional spoke
Independent and timely region-specific plans and assessment reports

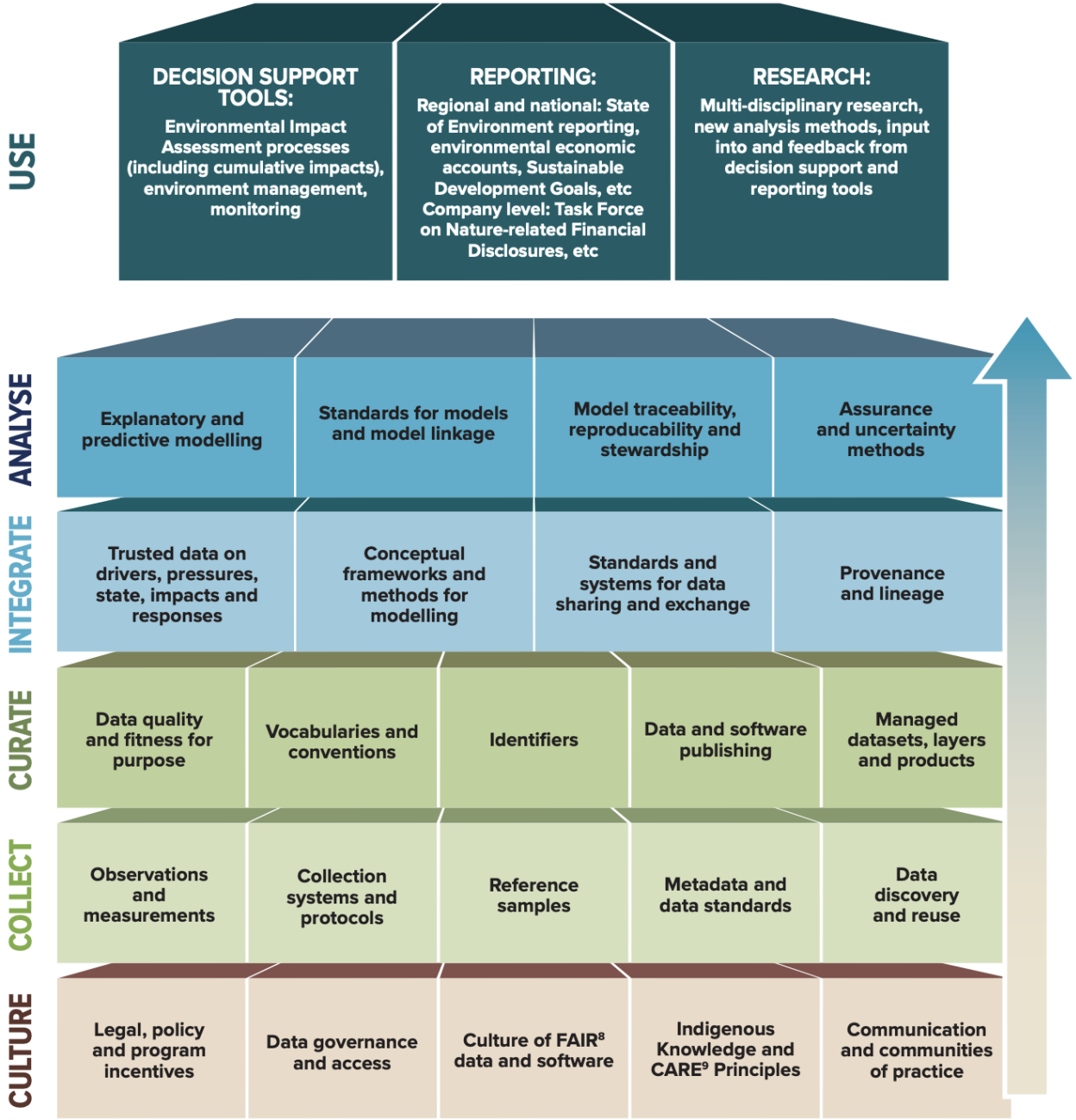
Shared Environmental Analytics Facility

- **Robust, repeatable & sustainable**
- Scalable, trusted & secure
- Operationalised delivery of knowledge products informed by the best science and data



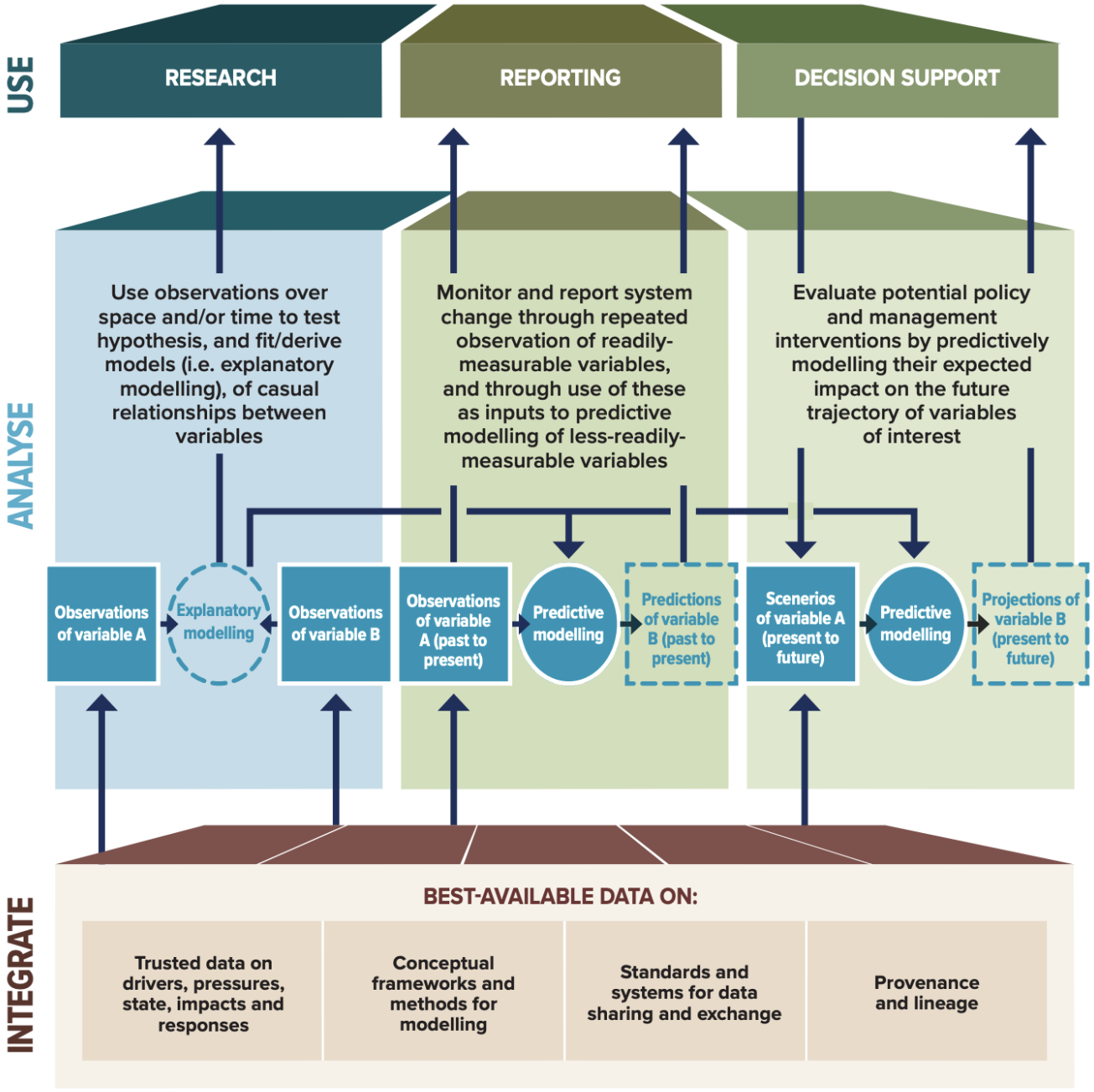
Shared Analytical Framework for the Environment (SAFE)

- A shared language and blueprint for how environmental data, analytics and decision support tools interconnect across agencies and sectors
- Defined capabilities in the data-to-decision pipeline
- **Goal: Robust, repeatable and transparent decision making for environmental assessments**

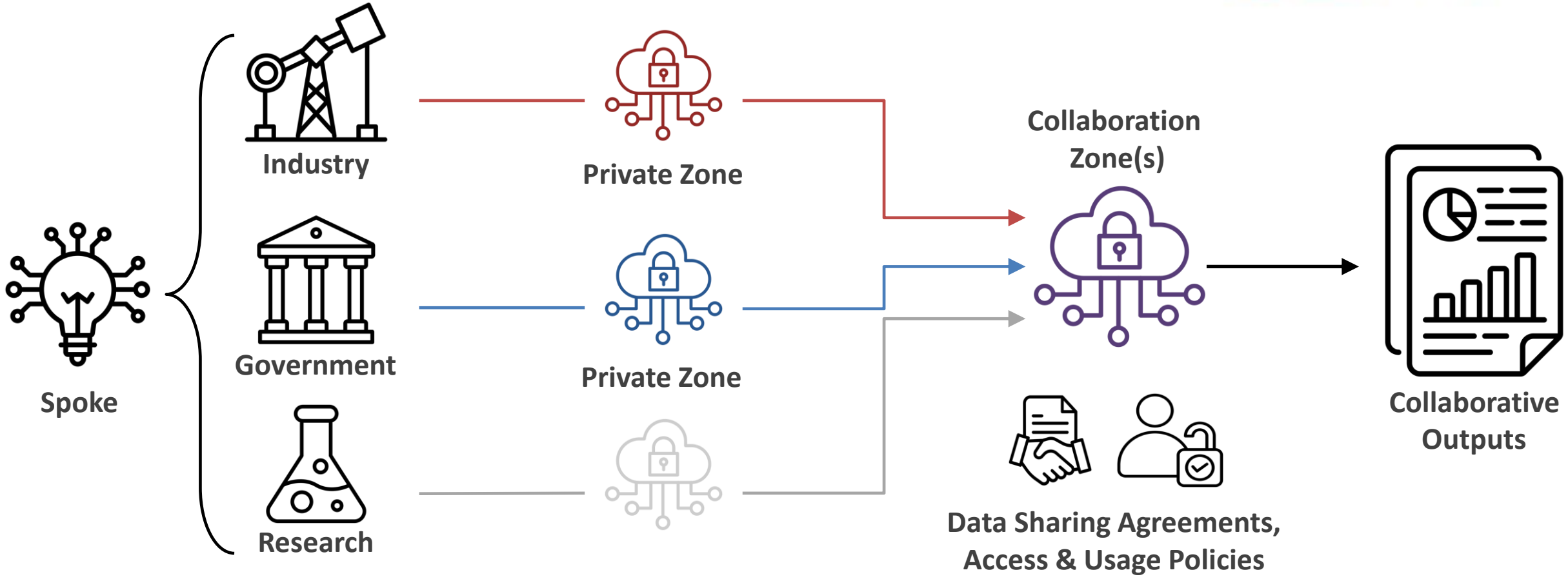


SEAF: Operationalising SAFE

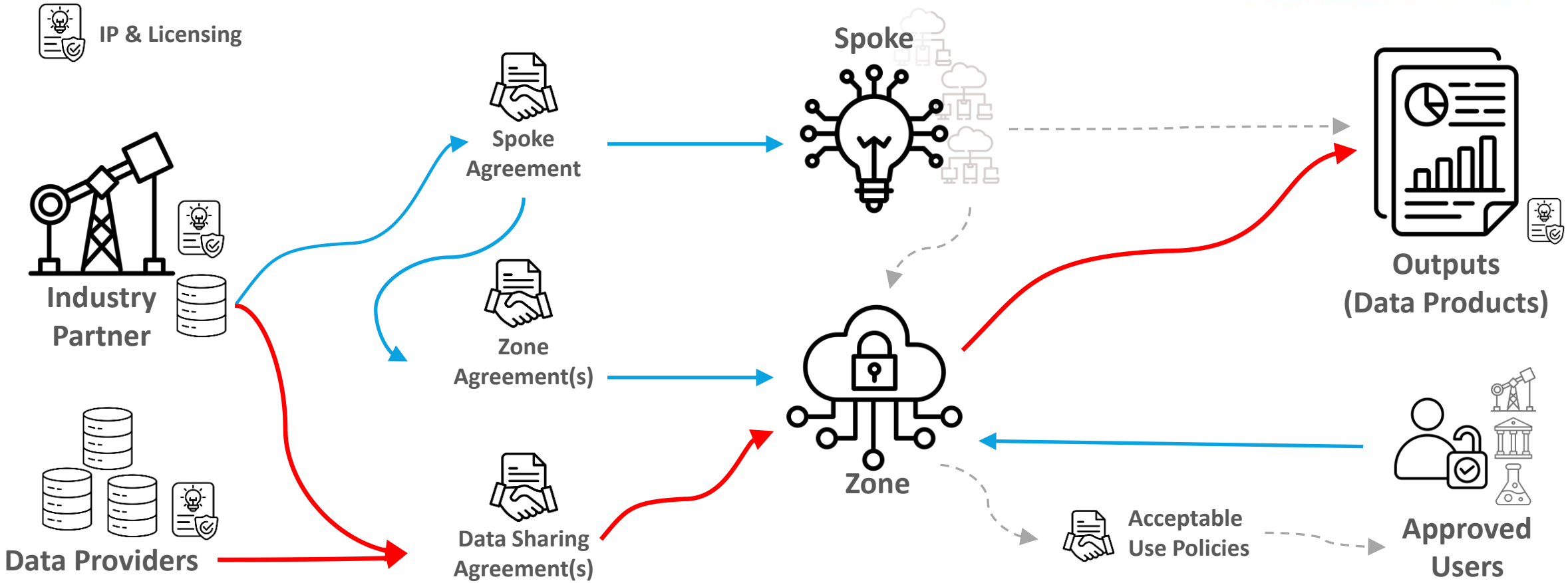
- Connecting government, industry and researchers to share the best available data
- Supporting collaborative modelling and analysis
- Producing decision support tools, reports, and improved analytical methods



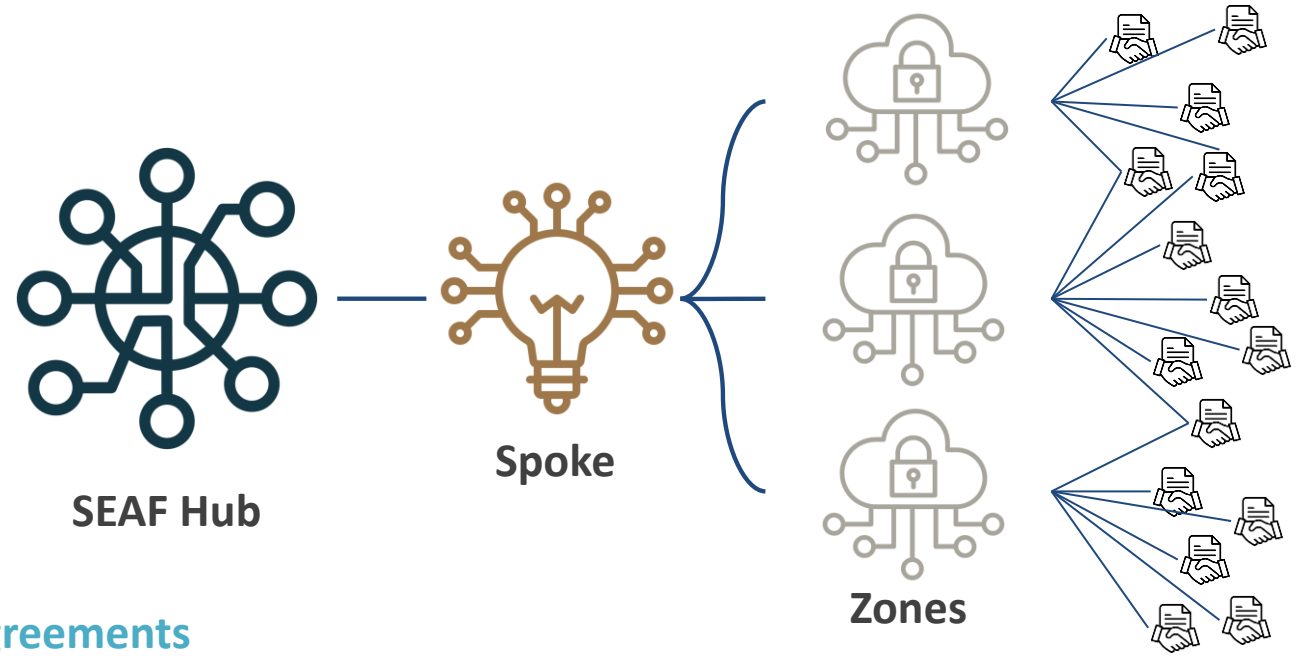
Trusted Collaboration



Operational Data Flow →



SEAF Hub and Spoke Agreements



Agreements

Hub SLAs

Spoke Agreement

Zone Agreements

Data Sharing Agreements

Zone AUPs

- Each layer needs consistent governance
- Custom agreements generate unsustainable overhead
- Risks implementing different standards across identical issues
- **How do we scale without reinventing governance and technology for each layer?**

Challenges and Potential Risks

- Rapid, organic growth
  - Proliferation of contracts
  - Inconsistent application of standards
- Stakeholder readiness for dataspaces concepts
  - Cybersecurity
  - Sovereignty
  - Operational risks (anti-compete, etc)

SEAF Goals

- Robust, repeatable & sustainable
- Scalable, trusted & secure
- Operationalised delivery of knowledge products informed by the best science and data

INTERNATIONAL DATA SPACES ASSOCIATION

White Paper | Version 1.0 | December 2020

IDSA Rule Book

- Position Paper of members of the IDS Association
- Position Paper of bodies of the IDS Association
- Position Paper of the IDS Association
- White Paper of the IDS Association

1 Introduction

1.1 Who should read this rule book?

It is all about data. If your business has anything to do with generating or exchanging data or building/using data-driven ecosystems and business models, you should be thinking about data sovereignty. This book is for you.

This rulebook addresses:

- Peer-to-peer data sharing
- Data sharing ecosystems
- Data marketplaces
- Data-driven platforms
- Data-driven business models
- GAIA-X participants

1.2 Goals and scope

1.2.1 Goals of the IDSA

The IDSA aims to unlock the data economy of the future by providing the blueprint for secure, self-determined data exchange among trusted partners. This is what's referred to as "data sovereignty," and it is vitally important, in light of the fact that data access and exchange are rapidly becoming critical success factors for both companies and entire economies.

Until now, companies have held vast amounts of valuable data that they have been unable to control, share or monetize on their own terms. The IDSA has defined a reference architecture and a set of agreements that can be used to create virtual data spaces which establish trust among partners and a basis for innovative, new business models, products and services.

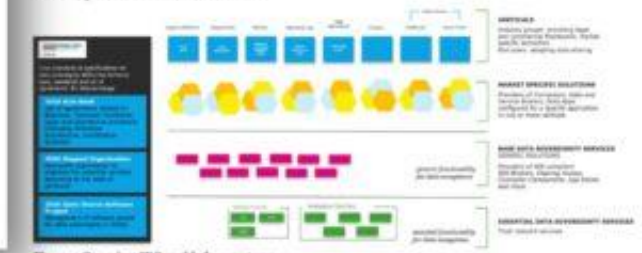


Figure 1 Overview IDS enabled ecosystems

The IDS protocol is based on commonly accepted data governance models so that it can facilitate secure data exchange and easy linkage across disparate systems, industries and geographies.

1.2.2 The purpose and scope of the rule book

In order for the future data economy to function smoothly and deliver on its value proposition, all players need to abide by a common governance framework that specifies the functional, technical, operational and legal agreements that structure their roles and interactions within and across the various parts of the ecosystem. This book outlines that framework.

By following these rules and guidance, all players can work together to reach our shared goal of unlocking the full value of the global data economy. For the purposes of this book, the key roles in the IDS ecosystem are as follows:

1. **The IDSA Support Organization**: Responsible for maintaining the rule book and for supporting its application. The IDSA support organization helps coordinate key processes and as general governance instance a foundation for the realization of internal structures and interfaces to other parties.

2. **The essential service providers**: Responsible for providing the essential services needed by all participants. They build the source of common agreements.

3. **All users of IDS**: Users will need guidance on how to proceed within this framework to realize use cases on the foundation of a trustworthy infrastructure and governance.

Figure 2 Overview Rule Book scope and goals

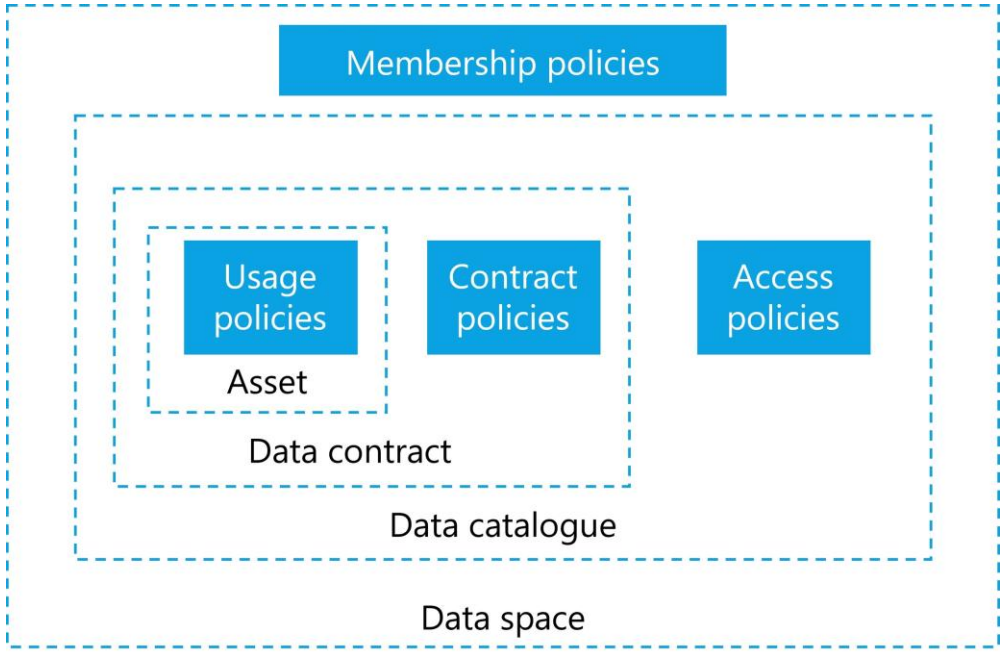
Layers of Dataspace Governance (IDSA Rulebook)

Dataspace Layer	Description
Instance governance	Executes and implements the governance practices and rules of a dataspace instance. Oversees data space functions and rules for day-to-day operations in a particular instance.
Ecosystem governance	Defines the rules for data space instances. Creates the intra-dataspace trust between collaborating organisations. Complements standardisation and regulation focusing on business-driven rules. Defines inter-dataspace interoperability practices.
Domain governance	Establishes sector-specific data space principles and mechanisms including semantic interoperability and domain-specific regulation. Leaves room for geographical differences while supporting maximum interoperability.
Soft infrastructure governance	Brings all the generic dataspace building blocks and concepts together, defines the legal basis for engagement and creates the common framework on which all dataspaces (ecosystems and instances) are built.

Functional Levels of Dataspace Governance (IDSA Rulebook)

Level	Description
Technical	The software and hardware components for controlled, sovereign and secure sharing of data
Semantic	The shared meaning of data to minimise the complexity of interoperability, interconnection and collaboration
Organisational	The way in which the agreements, expectations and processes are aligned to achieve the common goals for controlled data sharing
Legal	Legislative and contractual compliance that underpin data sharing and usage

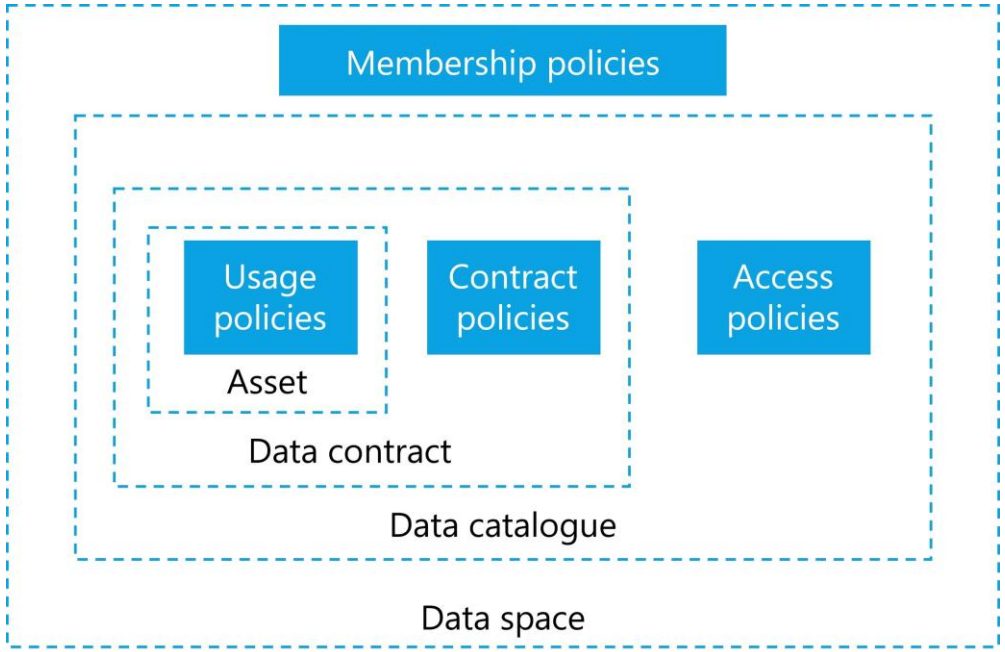
IDSA Policy Framework



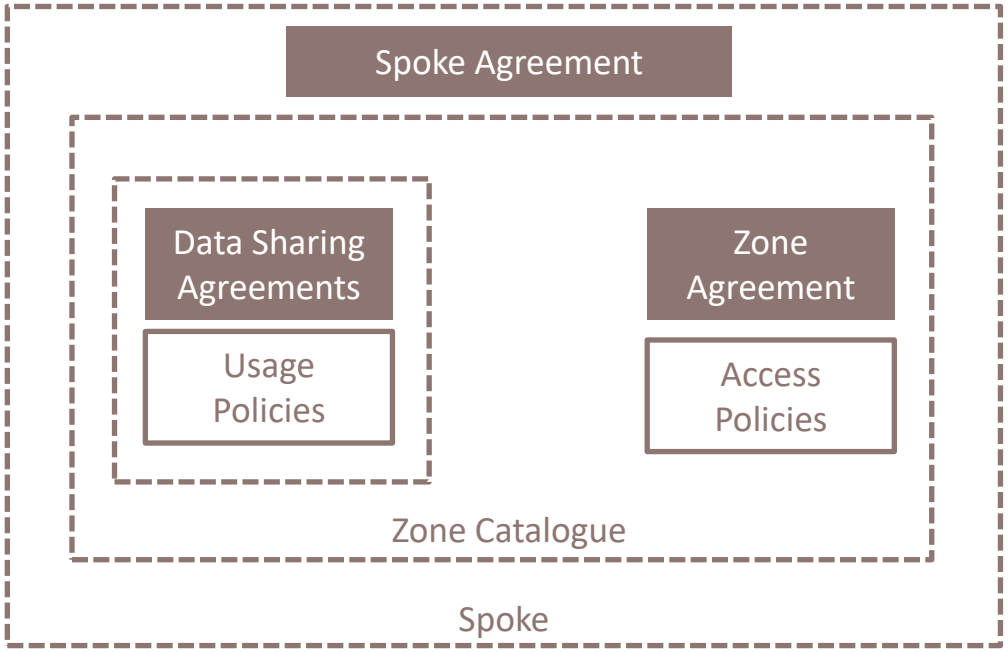
- Nested policies and governance
- Attribute-based trust
- Policy enforcement and transparency

Policy Framework Alignment

IDSA Policy Framework



SEAF Policy Framework



Robust, repeatable & sustainable structures

Global Interoperability

- **SEAF** enables secure environmental data collaboration between industry, researchers, and agencies while maintaining data sovereignty and control
- **IDSA** provides proven frameworks and standards that eliminate unnecessary custom agreements, reducing overheads and accelerating onboarding
- **Global interoperability** through standardised protocols can connect environmental insights to international research networks and monitoring systems without rebuilding infrastructure

A Collective Effort

The Western Australian Biodiversity Science Institute

Western Australian Marine Science Institution

ARDC Australian Research Data Commons

NCRIS National Research Infrastructure for Australia — An Australian Government Initiative

ARDC is enabled by NCRIS

SEAF

Government of Western Australia
Department of Jobs, Tourism, Science and Innovation

Government of Western Australia
Department of Water and Environmental Regulation

Australian Government
Department of Climate Change, Energy, the Environment and Water

Government of Western Australia
Department of Transport

WESTPORT

WATER CORPORATION

RioTinto

BHP

CME
The Chamber of Minerals & Energy of Western Australia

CSIRO

Pawsey

THE UNIVERSITY OF WESTERN AUSTRALIA

Microsoft

pwc

IXup

databricks

ARINCO

Sentient Hubs

What can we learn from each other

- **Active pilots:** SEAF is operational now with real stakeholders, data flows, and governance challenges providing a live testing ground for dataspace frameworks in complex, multi-stakeholder environments
- **Domain expertise:** Environmental data governance lessons around sovereignty, licensing complexity, and regulatory compliance are directly applicable across healthcare, agriculture, supply chain, and other sectors facing similar challenges
- **Partnership opportunities:** We are always seeking opportunities to share experiences, engage and collaborate with industry, government researchers, policy experts, technology implementers, and other dataspace initiatives

Placeholder slide for ARDC Birds of a Feather Dataspaces Session

Thank you

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