In-Service Aircraft for a Global Observing System

IAGOS and its Contributions to FAIR DATA

in the Domain of

Environmental Research Infrastructures

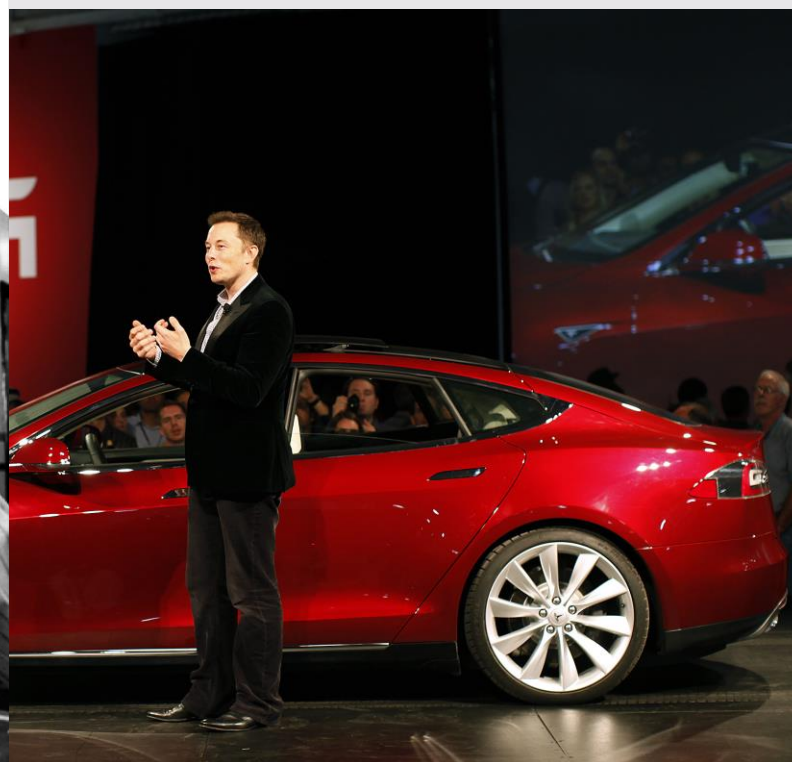## The Keeling Curve and the Tesla or: Who is the Innovator?

UPSTREAM AND DOWNSTREAM INNOVATION

www.iagos.org

Development of new instrumentation

Data usage, development of new products with public and industry partners

Upstream

Observation Data Production Knowledge

Exploration of new parameters and new instruments with industry partners

Downstream

Scientific exploration of data
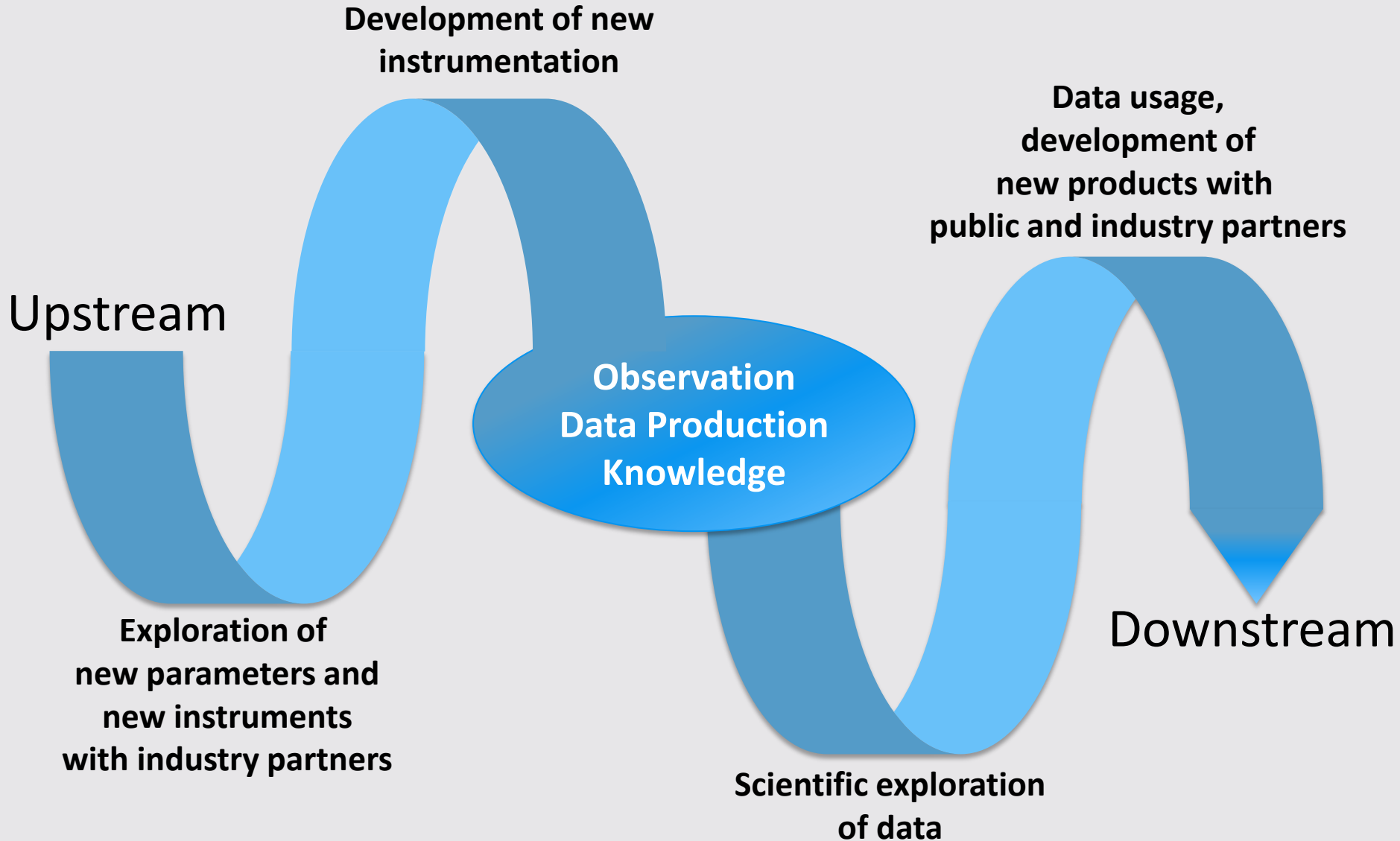
The ENVRI Cluster

European Strategy Forum on Research Infrastructures - ESFRI
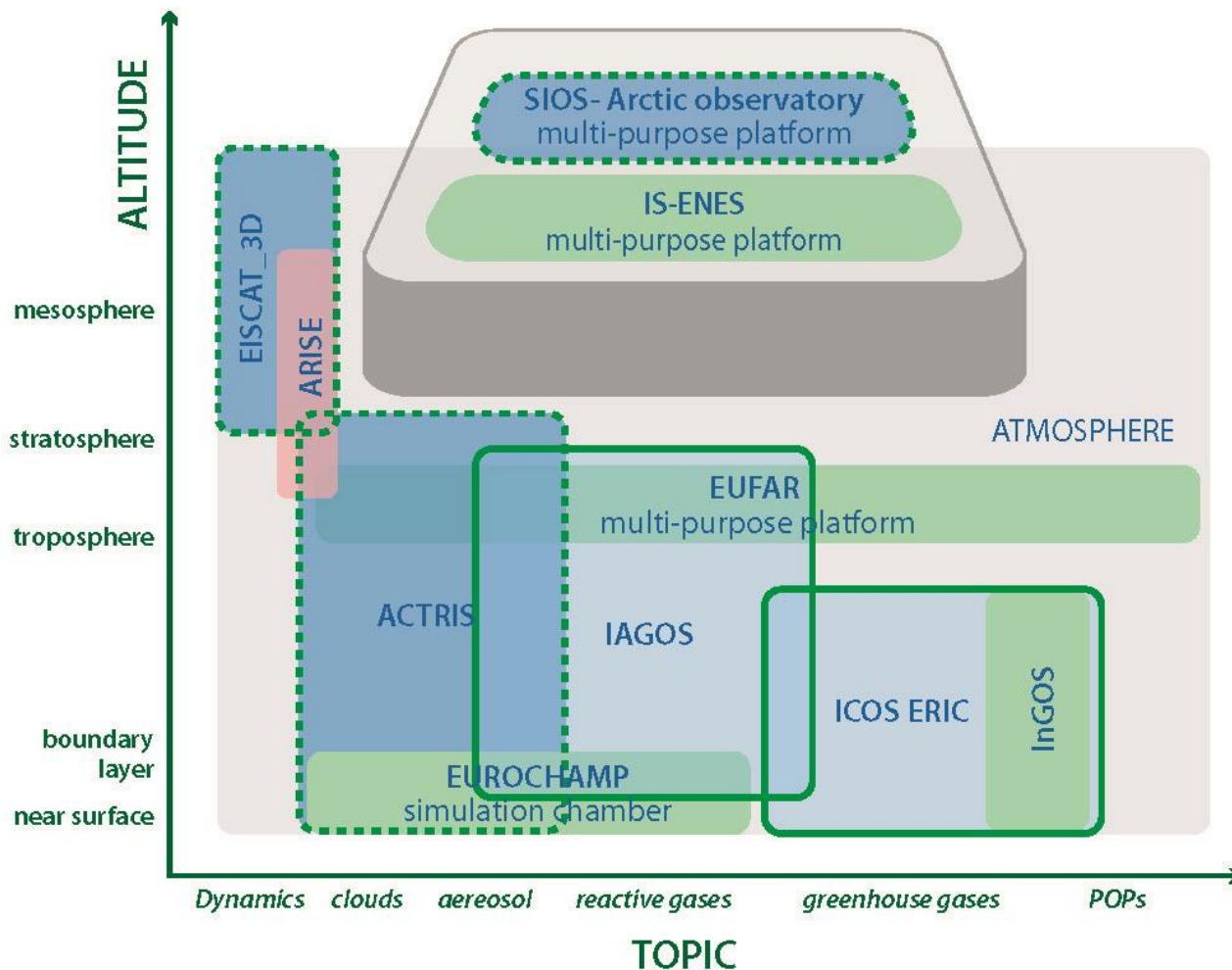
IAGOS role

Key Landmark

Atmos. Domain leader

Coordinator of ENVRI-FAIR Data project

DATA LIFECYCLE AND SERVICES

IAGOS
www.iagos.org

SERVICES

Acquisition	Transmission	Collection	Qualification	Storage	Accessibility
Time series measurements	Satellites, phones lines, radio links, …	Data centers, Real Time analyses, elaboration	Digital objects (Data+ Metadata, Persistent Identifiers)	Community Data Infrastruct., Big Data Centers	Discovery, Download, HPC, Data-intensive, AAI

Acquisition → Transmission → Collection → Qualification → Storage → Accessibility

Data acquisition, validation & standardization

Data collection & preservation (PID, DOI)

Accessibility, integration, computation
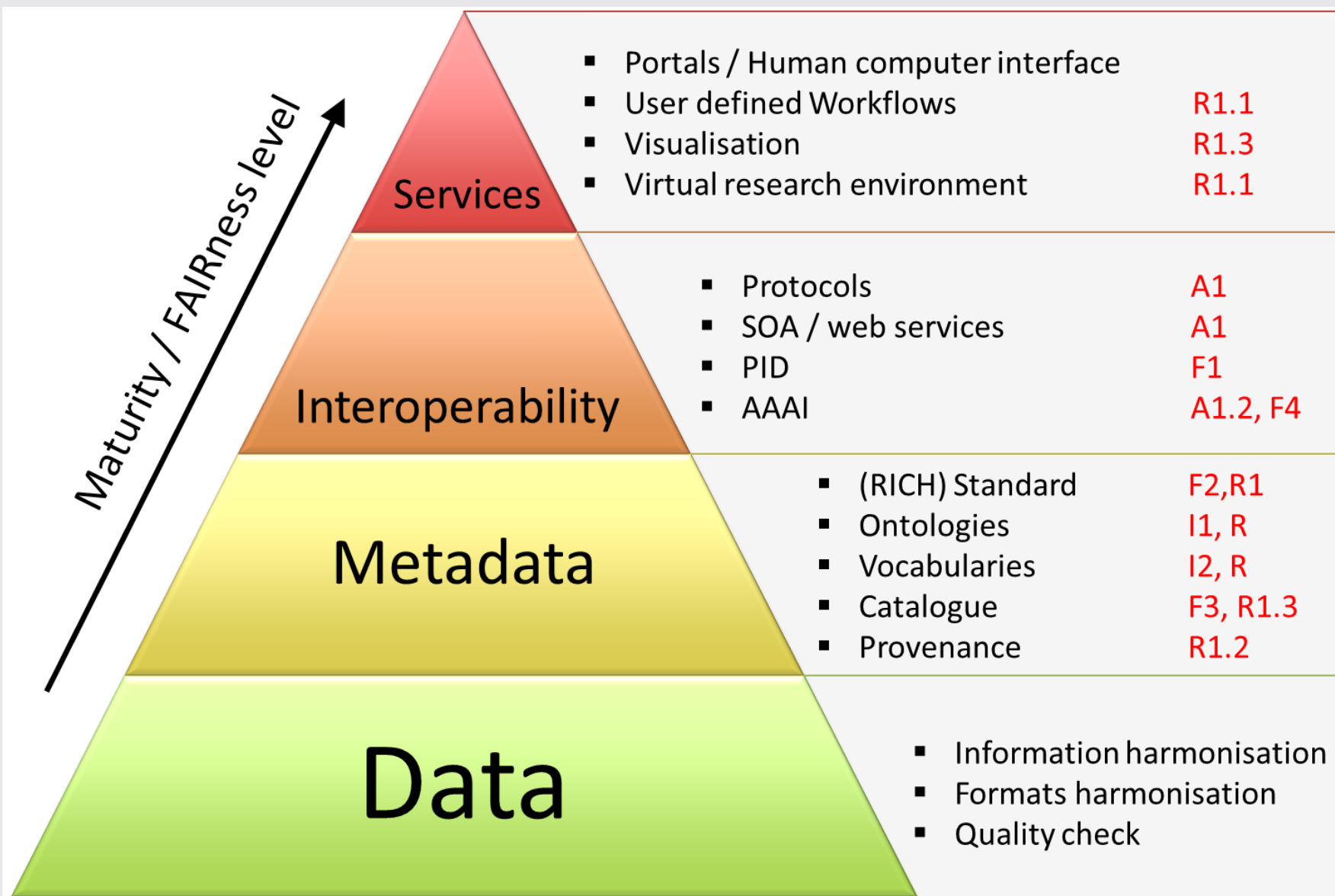
FAIR Data Principles

Designed by FORCE 11 (open data advocate-) group to describe the general requirements that "Open Data" should fulfill

- General in nature, top level initiative
- Leave a lot of definitions and standards open

Consist of four main points. Data should be:

- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**e-usable

https://www.force11.org/group/fairgroup/fairprinciples

ROADMAP TO FAIR NESS

Maturity / FAIRness level

Services
- Portals / Human computer interface
- User defined Workflows — R1.1
- Visualisation — R1.3
- Virtual research environment — R1.1

Interoperability
- Protocols — A1
- SOA / web services — A1
- PID — F1
- AAAI — A1.2, F4

Metadata
- (RICH) Standard — F2, R1
- Ontologies — I1, R
- Vocabularies — I2, R
- Catalogue — F3, R1.3
- Provenance — R1.2

Data
- Information harmonisation
- Formats harmonisation
- Quality check

FAIR PRINCIPLES (FORCE11)

TO BE FINDABLE:

F1. (meta)data are assigned a globally unique and eternally persistent identifier.
F2. data are described with rich metadata.
F3. (meta)data are registered or indexed in a searchable resource
F4. metadata specify the data identifier.

TO BE ACCESSIBLE:

A1 (meta)data are retrievable by their identifier using a standardized communications protocol.
A1.1 the protocol is open, free, and universally implementable.
A1.2 the protocol allows for an authentication and authorization procedure, where necessary.
A2 metadata are accessible, even when the data are no longer available.

TO BE INTEROPERABLE:

I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles.
I3. (meta)data include qualified references to other (meta)data.

TO BE RE-USABLE:

R1. meta(data) have a plurality of accurate and relevant attributes.
R1.1. (meta)data are released with a clear and accessible data usage license.
R1.2. (meta)data are associated with their provenance.
R1.3. (meta)data meet domain-relevant community standards.

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Connecting ESFRI Infrastructures to EOSC through Cluster Projects

The high-impact ambition of ENVRI-FAIR is:

to establish the technical preconditions for the successful implementation

of a virtual, federated machine-to-machine interface to access environmental data and services provided by the contributing ENVRIs.

This interface is called the ENVRI-hub.