CERN Open Science Policy
Background, elements and implementation

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February 2023, FAIR OS Workshop

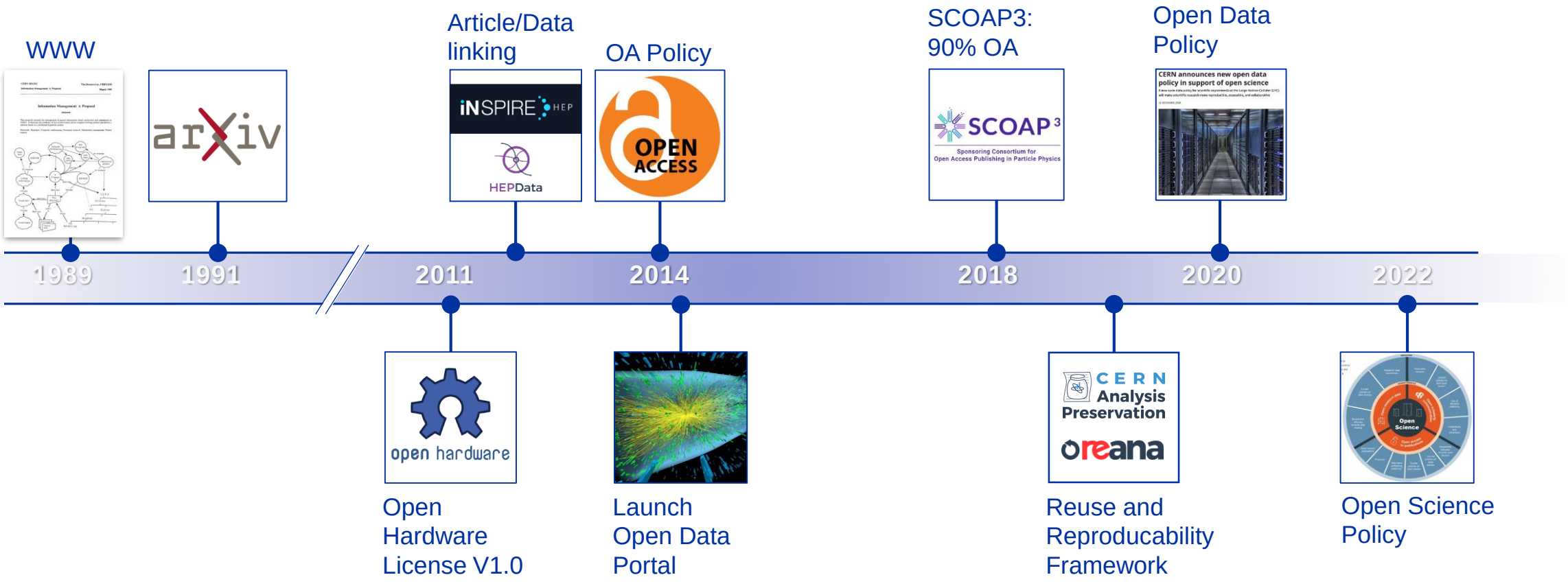
Agenda

1 Background

2 Open Science Policy and some elements

3 Implementation

CERN – on the path to universal Open Science



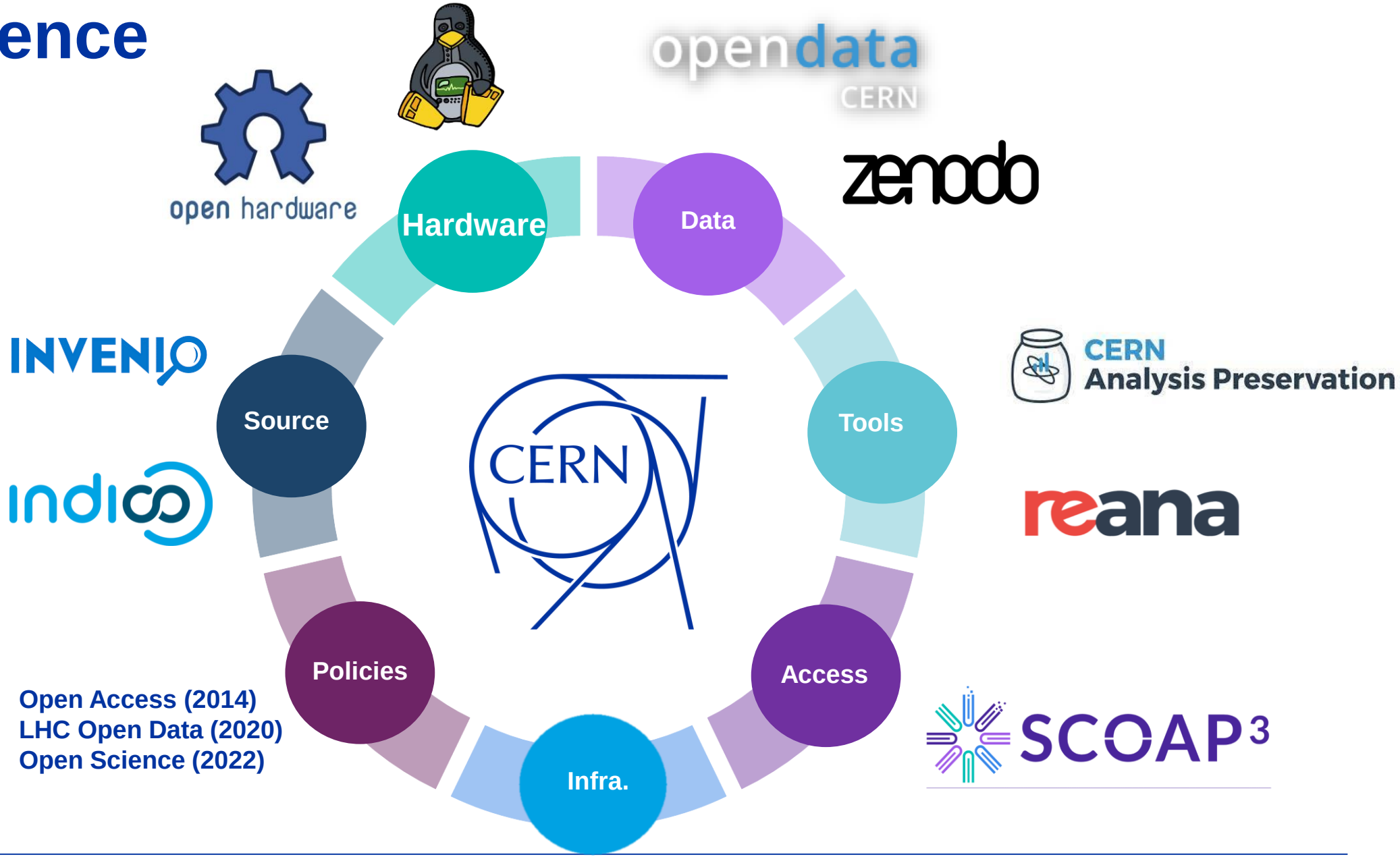
Open Hardware License V1.0

Launch Open Data Portal

Reuse and Reproducability Framework

Open Science Policy

Open Science at CERN



Open Access (2014)
LHC Open Data (2020)
Open Science (2022)

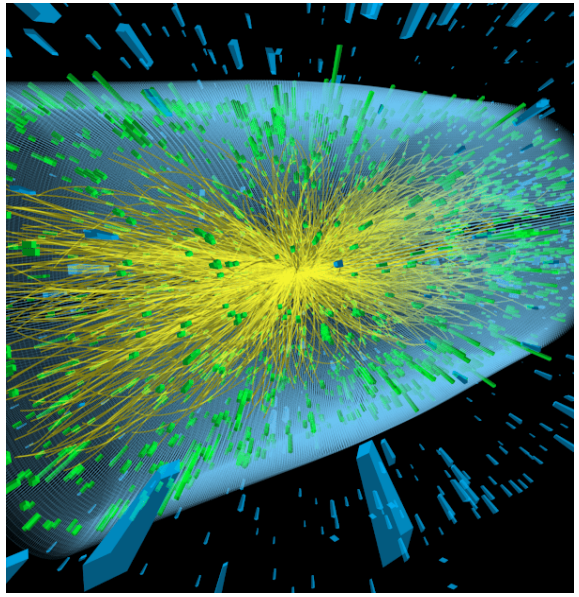
Policy framework for Open Science at CERN

CERN Open Access Policy (2014)

- All CERN research articles published OA (CC-BY)
- Central fund available
- Different routes (SCOAP^3, Read & Publish, APC payment)

LHC Open Data Policy (2020)

- 4 LHC collaborations will release all level 3 data (+ level 1 and 2)
- Gradual release will start ~5 years after collection
- Other experiments to follow

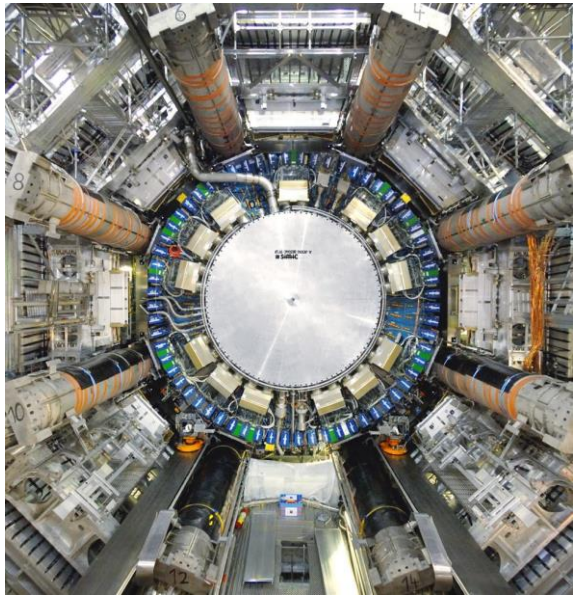


CERN Open Science Policy (2022)

- Open…
  - Access
  - Hardware
  - Data
  - Software
- Reusability & reproducibility
- Research Assessment
- Education & Outreach

Funder Open Science Policies

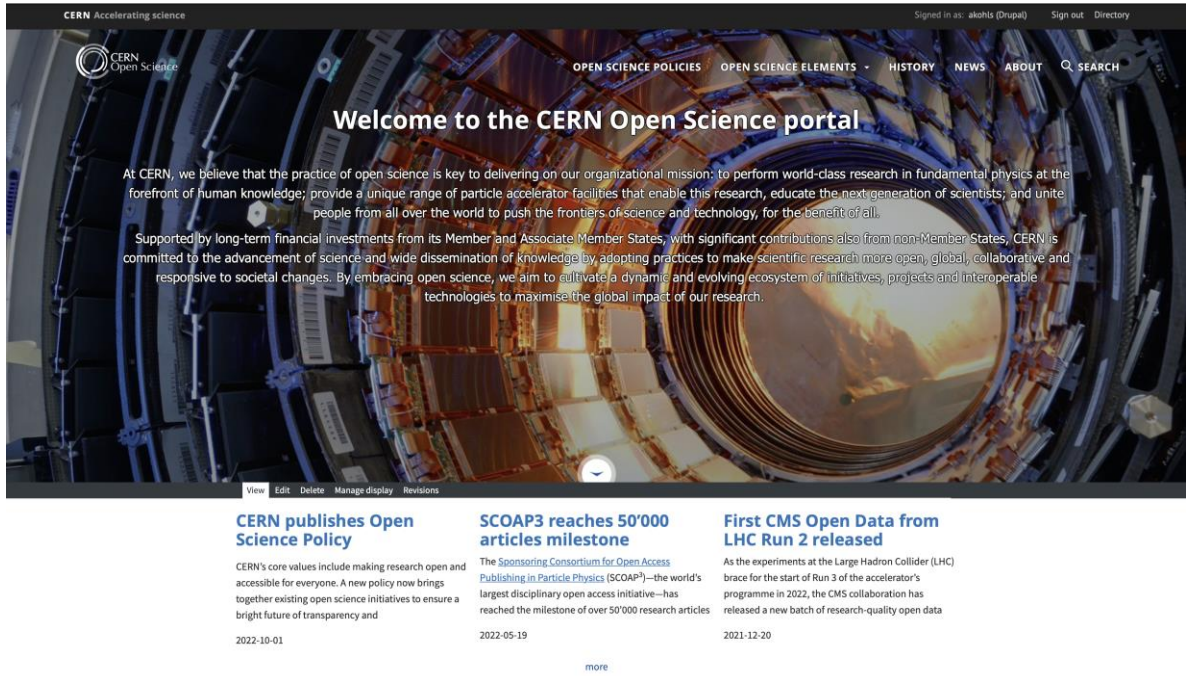
- Funding agencies supporting experimental collaborations have specific open data requirements
- CERN will establish central support office for compliance



October 2022: CERN Open Science Policy in place

After 12 months of consultations and collaborative drafting, CERNs first institutional Open Science Policy was formally adopted.

- August/September: Presentations and discussions with directorate
- 29th September: Policy presented to CERN Council
- 1st October: Policy formally in place



More information: https://openscience.cern

OSWG Members
(Feb 2023)

Joachim Mnich (CERN Director for Research and Computing)
Pippa Wells (Deputy Director for Research and Computing)
Alex Kohls (CERN Scientific Information Service)
Axel Naumann (SFT Group in the Experimental Physics Department)
Bob Jones (Deputy Department Head CERN IT)
Christopher Parkinson (non-LHC Experiments)
Clemens Lange (CMS Experiment)
Dietrich Liko (CMS Experiment)
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Tim Smith (CERN IT)
Zach Marshall (ATLAS Experiment)

CERN Open Science Policy

- **Captures current practice and states progressive vision across multiple Open Science domains:**
  - Open Access to Publications
  - Open Research Data
  - Open Software
  - Open Hardware
  - Research Integrity, Reuse & Reproducibility
  - Infrastructure for Open Science
  - Research Assessment & Evaluation
  - Education, Training & Outreach
  - Citizen Science
- **Policy to be regularly updated to reflect changes in landscape, practices, funder requirements & community demands**
- **Policy and its implementation plan are developed and governed by the community.**
- **V1.0, Oct 2022: https://cds.cern.ch/record/2835057**

Open access

1. Open access to publications

All CERN scientific publications are to be made immediately publicly available and reusable. The Open Access Policy for CERN Publications (2014, updated 2017 and 2021) requires that all original research publications by CERN authors are published open access, centrally supported by the CERN Open Access fund. CERN users and visiting scientists are also encouraged to publish their work under similar terms, according to the CERN General Conditions applicable to the Execution of Experiments.

CERN scientific publications, including submissions to trusted repositories (such as arXiv), should be released under an open licence, with CC-BY as the default standard. Publication-related metadata are made available for reuse under the CC0 waiver in line with FAIR principles (findability, accessibility, interoperability, reusability). Open access publishing support is also provided for monographs related to CERN experiments or accelerators, applied research processes or technologies, and other areas of relevance.

https://cds.cern.ch/record/2835057

Open data

2. Open data

CERN experimental collaborations are committed to making their research data publicly available. The CERN Open Data Policy for the LHC Experiments (2020) aims to support CERN experiments' consistent approach towards the openness and preservation of experimental data to maximise their long-term value. All data are released with persistent identifiers. Data and associated data services apply open and FAIR principles. For experimental data releases, CC0 waivers are applied as standard. Researchers and experiments are expected to develop data management plans for their research activities.

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Open source software

3. Open source software

CERN software is made available as open source wherever possible, applying a licence approved by the Open Source Initiative (OSI). CERN handles its research-related software as an integral part of its research products. Analysis of the CERN experiments' physics data must be possible with open source software. External communities should be invited to use and contribute to the evolution of CERN's software projects. CERN's software expertise should be shared with other science disciplines. Software development processes are expected to follow best practices[4]. CERN contributes to open source software relevant to its mission through code contributions, participation in the evolution of software, and standardisation.

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Open hardware

4. Open hardware

CERN makes its technologies broadly available to society and has introduced open hardware licensing as a key mechanism to achieve this goal. Open hardware designs are made available through the Open Hardware Repository. The legal basis for the sharing of open hardware is enabled through variants of the CERN Open Hardware Licence. Hardware design releases will consider opportunities for collaboration with other research communities and industry. In cases where extensive documentation and ancillary components like software for interfacing and testing are required for projects, these should be licensed under appropriate open source documentation and software licences respectively.

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Research integrity, reuse and reproducibility

5. Research integrity, reuse and reproducibility

CERN is committed to ensuring the integrity of research. In order to facilitate the reuse of its research products, CERN provides infrastructures to accommodate the scale and complexity of its research outputs. Reuse and reproducibility are facilitated by practising comprehensive analysis preservation to capture relevant research objects, such as research data releases with supporting metadata, auxiliary data, linked software, reproducible analysis workflows, documentation, etc.

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Implementation Plan to support the policy

- **Actionable measures to support the policy's implementation across the organization and in the experiments@CERN**
- **Each chapter with editors/shepherds of the OSWG, but everyone within the WG could contribute to the development of each part**
- **Draft reviewed by member of directorate. Revision submitted.**
- **Challenges:**
  - Domains vary in their maturity and adoption. Different measures needed from grassroot activities to fully operational services
  - Different mandates, histories and understandings of topics
  - Roles, responsibilities, funding and sustainability
  - How to scale and coordinate the measures over the course of the next two years?

It is a starting point, or milestone – not the end of a project…

- **Open Science Policy since October 2022**
- **V1.1 of a corresponding implementation plan completed**
  - Will be openly accessible as well
  - Versioned implementation plan
- **Roadmap ahead is ambitious and requires coordination and (new) collaboration on almost all topics of the policy**

Thank you!

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