FET PC meeting 22 March 2019, Brussels

Preparatory Actions for FET Flagships

Flagships Unit

DG Connect, European Commission

6 + 1 topics, one year

"Launch of six European initiatives with potential for transformational impact on society and the economy" – 5 March 2019

- Humane AI
- Time Machine
- Lifetime
- Restore
- Energy-X
- Sunrise
- Battery 2030

Start date: 1 March 2019
Duration: 1 year

Mid-point: September 2019

HUMANE AI

*Design and deploy **AI systems that enhance human capabilities and empower people** - both as individuals and society as a whole: to **develop AI that extends rather than replaces human intelligence**.*

❑ *coordinated by DFKI (DE)*
❑ *35 partners from 17 countries*
  http://www.humane-ai.eu/

Challenges include:
❑ *learning complex world models;*
❑ *building effective and fully explainable machine learning systems;*
❑ *adapting AI systems to dynamic, open-ended real world environments;*
❑ *achieving in-depth understanding of humans and complex social contexts;*
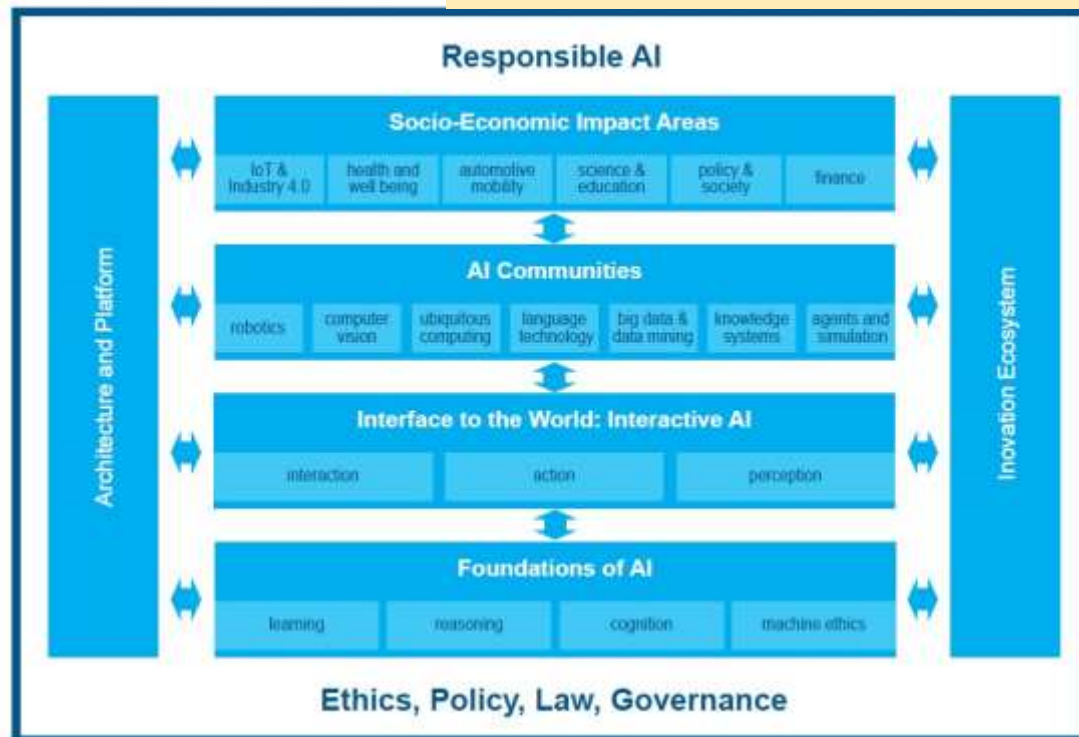❑ *and enabling self-reflection within AI systems.*

Figure 2. Structure of the research agenda of the proposed HumanE AI Flagship.

HUMANE AI

Major planned events:

- ❑ *June 2019*
    - ❑ Stakeholder workshop I

- ❑ *September 2019*
    - ❑ Roadmap
    - ❑ First version of a consolidated organization and operation plan, impact strategy and research plan

- ❑ *December 2019*
    - ❑ Stakeholder workshop II

- ❑ *February 2020 - HumanE AI global summit*
    - ❑ Final version of the initiative concept, organisation and operation plan, impact strategy and research plan
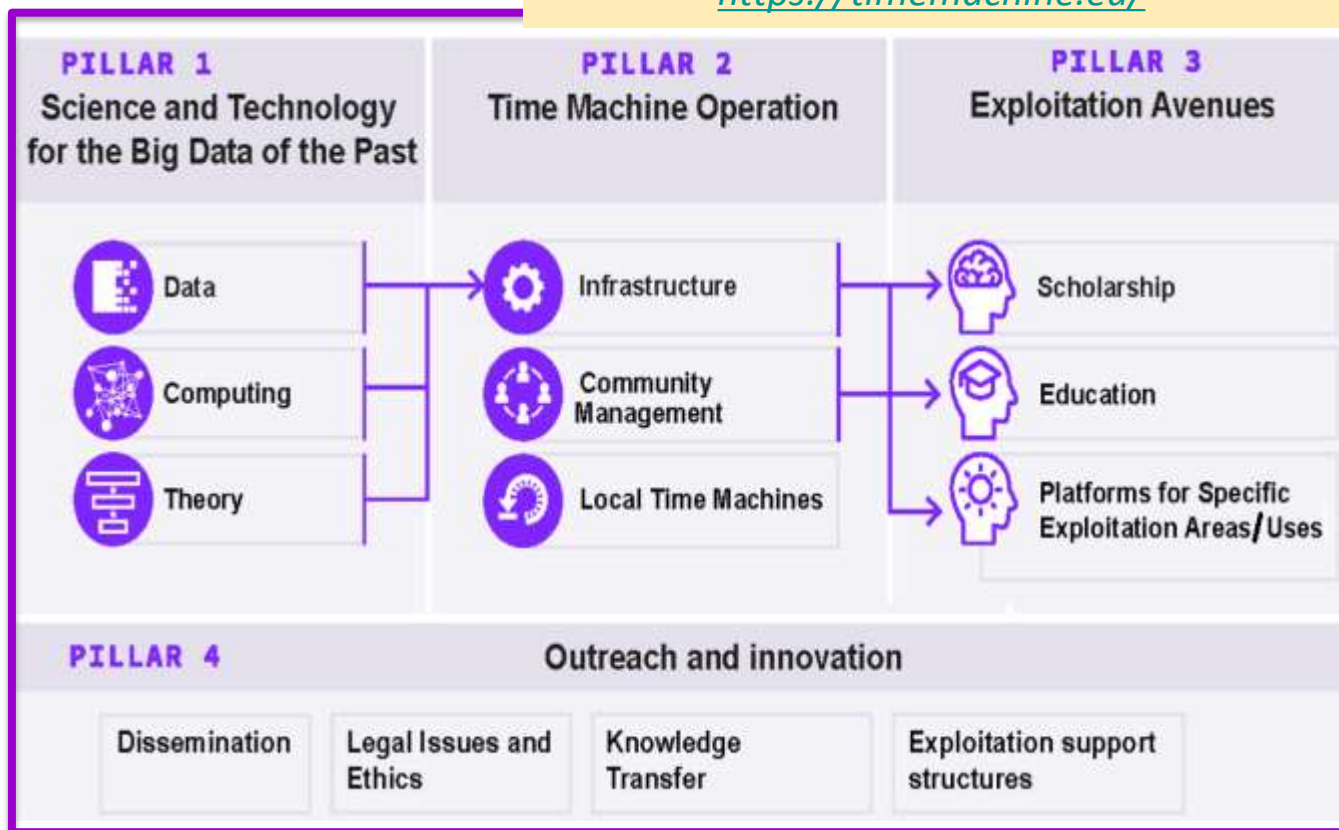
Time Machine

Time Machine

*To build a **large-scale digitisation and computing infrastructure** (based on multi-scale modelling and simulation & AI technologies) for digitising huge volumes of information from **Europe's historical archives, large museum and library collections, and geo-historical datasets** that are **mapping millennia of European historical and geographical evolution**.*

- ❑ *coordinated by Frédéric KAPLAN (EPFL)*
- ❑ *33 partners from 11 countries*
    https://timemachine.eu/

IMPACT: *Making available these vast amounts of Europe's cultural and historical knowledge will have a profound effect on understanding Europe's historical and societal evolutions and an impact on key sectors such as the ICT industry, creative industries, and tourism.*

PILLAR 1
Science and Technology for the Big Data of the Past

PILLAR 2
Time Machine Operation

PILLAR 3
Exploitation Avenues

Data

Computing

Theory

Infrastructure

Community Management

Local Time Machines

Scholarship

Education

Platforms for Specific Exploitation Areas/Uses

PILLAR 4 — Outreach and innovation

Dissemination | Legal Issues and Ethics | Knowledge Transfer | Exploitation support structures

Major planned events:

- ❑ *April 2019*
    - ❑ *TM Manifesto*

- ❑ *June 2019*
   - ❑ *Draft roadmaps of the 4 TM pillars*

- ❑ *October 2019:*
    - ❑ Roadmaps of the 4 TM pillars
    - ❑ TM 2019 conference (Dresden, Germany)

- ❑ *December 2019:*
    - ❑ TM preparatory action's final conference

LIFETIME

To decipher how diseases start and progress in the human body by developing and integrating several break-through technologies including **single-cell multi-omics and imaging, machine learning and AI, and personalised disease models such as organoids.** This is a major challenge and will have dramatic impact on the **early detection, prevention and innovative treatment of chronic and progressive diseases.**
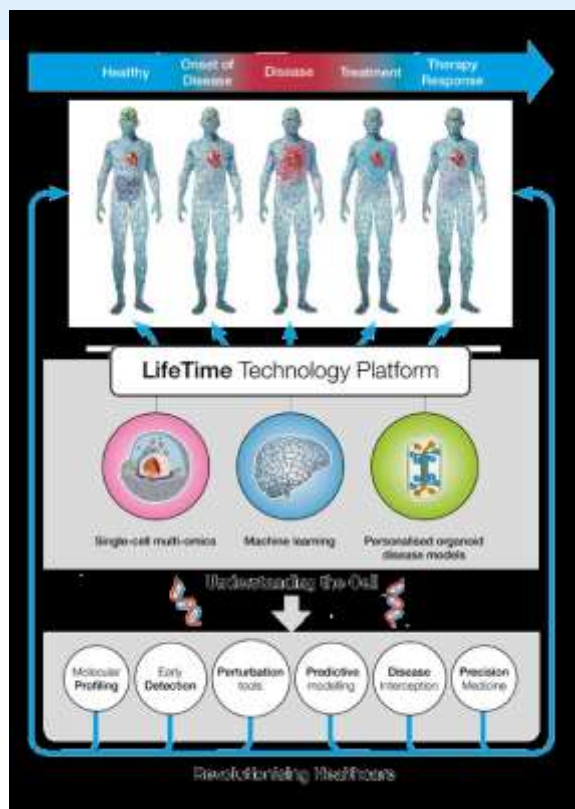
❑ *coordinated by Max Delbrück Center for Molecular Medicine (DE)*
❑ *17 partners from yy countries*
   https://lifetime-fetflagship.eu/

❑ *Further develop the LifeTime vision and unifying goal.*
❑ *Engage with a wide-variety of stakeholders.*
❑ *Produce a strategic long-term S&T Roadmap.*
❑ *Define a blueprint for LifeTime's implementation.*
❑ *Establish an effective scientific leadership and governance structure.*
❑ *Arrive at a consolidated LifeTime framework.*

Major planned events:

- ❑ **June 2019: Opening Conference** - Leading international experts and the wider scientific community will be invited to describe the state-of-the-art, challenges and progress in potential technologies to be integrated in the LifeTime Technology Platform.

- ❑ **August 2019: international interdisciplinary "unconference"** to deliver the basis for developing the S&T Roadmap of the LifeTime Technology Platform.

- ❑ **December 2019**: 2-day **Open Space Conference** to present the LifeTime industry strategy and innovation framework.

Major planned deliverables:

- ❑ **August 2019**: Governance/structure models white paper

- ❑ **October – November 2019**: 8 white papers on the different dimensions of the LifeTime platorm.

- ❑ **December 2019** : Market and impact study

RESTORE

RESTORE aims to use basic science and technology developments to **create new clinical application opportunities of Advanced Therapies from rare to common chronic diseases, to revolutionise manufacturing of Advanced Therapies, to implement and exploit new Advanced Therapies in Clinical Practice** accessible for each citizen in Europe who need it.

❑ *coordinated by Charité Universitätsmedizin Berlin (DE)*
❑ *10 partners from 7 countries*
   https://www.restore-h2020.eu/

IMPACT:

❑ *Implementation of numerous Advanced Therapy Medicinal products into standard-of-care*
❑ *Novel drug supply chains required as conventional pharmacists cannot deliver the "living" drugs*
❑ *Unlike conventional treatment of chronic diseases, drastic reduction of cost burden/case over time*
❑ *Implementation of reimbursement models for patients travelling (even across national borders)*

RESTORE - Health by Advanced Therapies
(Advanced Therapy Medicinal Products and Biologised Medical Devices)

ALL for Advanced Therapies. With Passion. For Patients.

Major planned events:

❑ *August 2019 - Roadmaps*

    ❑ Mission-driven basic science and technology development for Advanced Therapies

    ❑ Clinical Research for Advanced Therapies

    ❑ Implementation of new Advanced Therapies

❑ *October 2019*

    ❑ Strategy paper on innovative early and late clinical trial design and regulatory rules for Advanced Therapies

Energy-X

*ENERGY-X aims to provide the essential missing component (X) in the **future European energy storage and chemical production landscape:** technologies to replace fossil resources. ENERGY-X will contribute to new science and disruptive technology enabling the **efficient conversion of solar and wind energy into chemical form** and will combine this ambition with scale-up to industrially relevant conditions by integrating with European industry.*

- ❑ *coordinated by DTU (DK)*
- ❑ *13 partners from 9 countries*
  https://www.energy-x.eu/

IMPACT:

- ❑ *Provide fuels for the transport sector*
- ❑ *Enable energy storage from weeks to months for intermittent electricity production*
- ❑ *Enable efficient transport of energy between regions in EU and beyond*
- ❑ *Stabilise the grid by exploiting excess electricity production in EU*
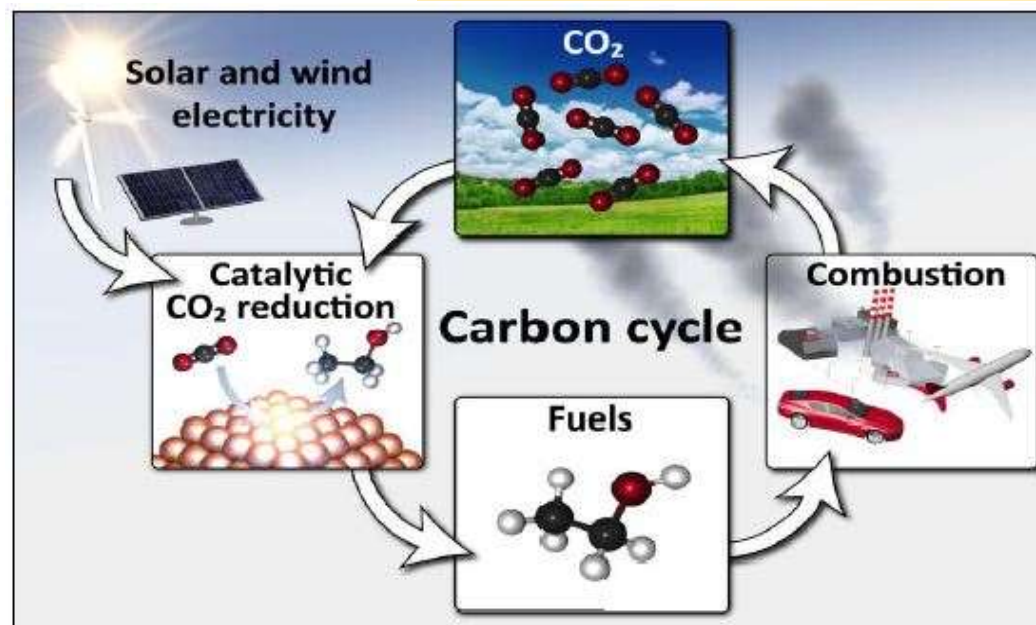
Major planned events:

- ## *May/June 2019 - Roadmaps*
  - Preliminary version of the strategic roadmap
  - Map of relevant Stakeholders

- ## *June 2019*
  - Joint event with the other Large Scale Research Initiatives

- ## *February 2020*
  - Final version of the strategic roadmap
  - Roadmap publication and presentation to a broader audience

SUNRISE will ***make sustainable fuels and commodity chemicals at affordable costs of materials and Earth surface****, using sunlight as the only energy source.*

❑ *Coordinated by Leiden University (NL)*
❑ *20 partners from 13 countries* *https://www.sunriseaction.com/*

Renewable energy
CO_2
Disruptive technologies
Sustainable chemicals
O_2
N_2
H_2O
Transport Agriculture Chemical Industry
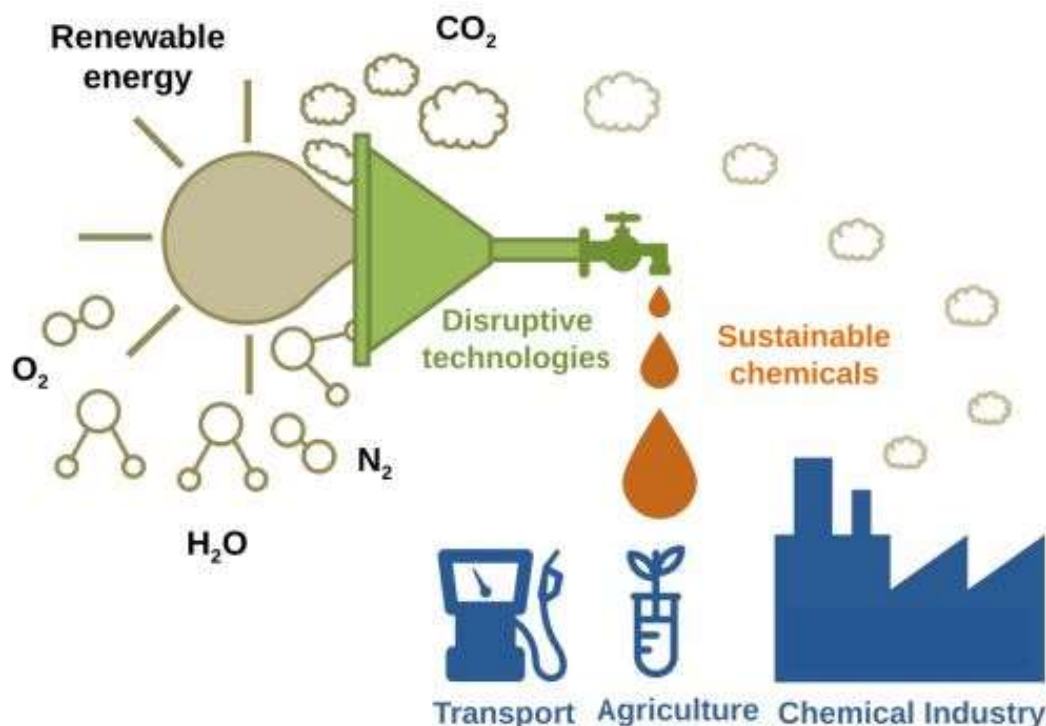
Objectives:
❑ *Develop the S&T roadmap of a future European large scale research initiative;*
❑ *Build the community including scientific, industrial and general public stakeholders;*
❑ *Establish an effective large-project governance scheme.*

SUNRISE

Major planned events:

❑ May 2019: Ramp-up conference

❑ February 2020: SUNRISE Symposium

Major planned deliverables:

❑ May 2019 : Vision document

❑ September 2019 : Roadmap

❑ March 2020: Blueprint - a public document identifying the necessary S&T resources, state-of-the-art EU facilities, available infrastructure & funding, and the criteria to make SUNRISE an open and inclusive initiative.

❑ March 2020 : Innovation and Exploitation Plan

Battery 2030

BATTERY 2030+ aim at inventing the batteries of the future with ultra-high performance, full sustainability, and smart design by exploiting the untapped potential of novel, affordable and sustainable materials, chemistries, smart functionalities, and cell designs.

❑ *Coordinated by Uppsala University (SE)*
❑ *17 partners from 9 countries https://www.battery2030.eu/*

M1
Start 1st of March 2019
Kick-off 26th of March

M1-M4
March-June 2019
State of the art

M5-M6
July-August 2019
First Draft Roadmap / Consultation

M8
October 2019
Second Draft Roadmap

M9
Nov. 2019
Consultation Workshop

M12
Feb. 2020
Final Roadmap
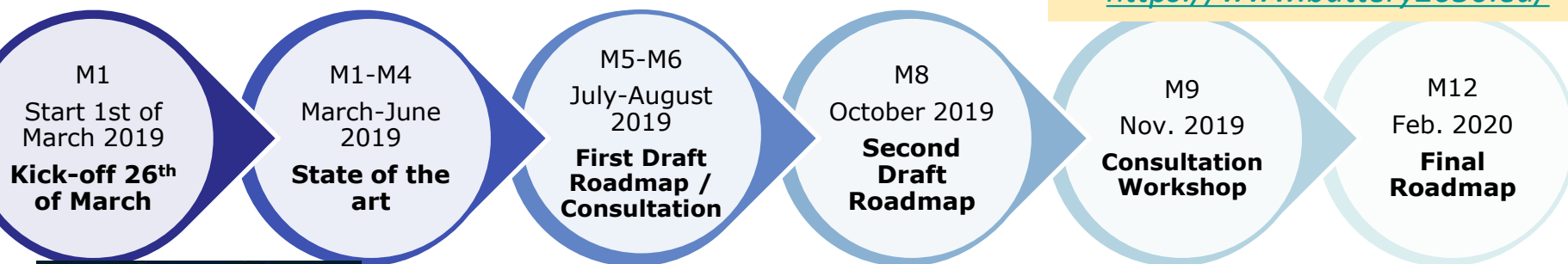
Battery 2030 Manifesto
http://battery2030.eu

Objectives:
❑ *Develop in cooperation with the research community the S&T roadmap of a 10-year cross disciplinary research initiative*
❑ *Propose R&I actions & funding schemes*
❑ *Get support from key stakeholders and EU Member States*

Battery 2030

Main meetings / events	On-going Discussions Established contacts
9th of October 2018 – Germany, BMBF & PtJ	Greece/Cyprus
13th of Feb. Norway – inv. by BoF repr	The Netherlands
15th of Feb. Finland – inv. by BoF repr	Portugal
19th of Feb. UK – Faraday Institute	Israel
12th of March. Sweden – inv. Innoenergy. Minister for Enterprise	Austria
12th of March. Denmark – the Danish Battery Society	Switzerland
20th of March. Serbia – inv. SASA	
4th of April – Kraftwerke batterien conference Achen	
8-9th of April. Polen – PolStorEn	
25th of April. Turkey – inv. National contact point FET. Tentative date.	
7th of June. France	
28th of June. Italy	
November 2019, Presentation of the BATTERY 2030+ roadmap, Brussels	

Planning to contact: Bulgaria, Czech Republic, Latvia, Lithuania, Romania, Slovakia

Links to Mission Areas

	Humane AI	Time Machine	Lifetime	Restore	Energy-X	Sunrise
Adaptation to Climate Change	●				●	●
Cancer	●		●	●		
Healthy Oceans	●				●	
Carbon-Neutral Smart Cities	●	●			●	●
Soil Health for Sustainable food	●				●	●

Disclaimer: tentative assignment based on current state of play

Links to Partnerships

	Humane AI	Time Machine	Lifetime	Restore	Energy-X	Sunrise
Health Innovations	●		●	●		
Digital Technologies	●	●	●	●	●	●
Metrology						
Air Traffic, aviation and rail					●	●
Circular, bio-based solutions					●	●
Energy Storage					●	●
Future Mobility	●				●	●
Innovative SMEs	●	●				

Disclaimer: tentative assignment based on current state of play

Links to Pillar II clusters

	Humane AI	Time Machine	Lifetime	Restore	Energy-X	Sunrise
Health	●		●	●		
Inclusive and Secure Societies	●	●				
Digital and Industry	●	●	●	●		
Climate, Energy and Mobility	●				●	●
Food and Natural Resources	●				●	●

Disclaimer: tentative assignment based on current state of play

❑ *EC communication campaign for these "6+1" topics*

5 March 2019

Launch of six European initiatives with potential for transformational impact on society and the economy

7 March 2019

Battery 2030+: inventing the batteries of the future

❑ *Press releases by individual actions*

- "**HUMANE AI**": DFKI LEADS AN EU-WIDE DRIVE TOWARDS HUMAN-CENTRIC, ETHICAL, VALUE-ORIENTED AI TECHNOLOGY

- Chancellor Angela Merkel praises **LifeTime**

- THE RESEARCH INITIATIVE **RESTORE** HEALTH – THERAPIES THAT CURE

- **SUNRISE**, a preparatory action towards a European large-scale research initiative

- New research initiative will power up Europe's **battery** revolution

What's next

- 25/3: **Workshop of Preparatory Actions with Commission services** to prepare for strategic planning

- ~June: **Horizon Europe strategic planning orientations** shared with Member States (tbc)

- Summer: launch of **Horizon Europe strategic planning public consultation**

- Early September: all preparatory actions have a draft plan to propose and engage in discussions

- 24-26 September: **Research and Innovation days** in Brussels

- January 2020: publication of **strategic planning** for the 4 first years of Horizon Europe

- Autumn 2019-Spring 2020: preparation of first **work programmes** under Horizon Europe