

ESA CLIMATE OFFICE

Way forward for CCI+ phase 2 & elements of a new climate programme

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CCI+ mid-term review

26 November 2020



IMPLEMENTATION OF CCI+ PHASE 2

THE BASE continue to

- provide satellite based, **high quality**, uncertainty characterised and validated **climate data records**
- foster close **links between the climate observation and modelling communities**
- Work closely with **operational climate services** on common R&D interests
- Continue to implement **knowledge exchange**, innovative approach responding to online environment

EXPAND the portfolio of

Essential Climate Variables:

pre-cursor studies on vegetation, long-Lived GHG, precursor for ozone/aerosol (NO_x, SO_x), surface currents

ADDRESS EVOLVING

REQUIREMENTS:

respond to (water, radiation, carbon) **cycle** focussed approach championed by GCOS and WCRP, move towards **ECV clusters**: ITT on cross-ECVs

PREPARE FOR THE FUTURE

Conduct thorough consultation process for the definition of the new climate programme, responding to international climate networks' requirements, including UNFCCC Paris Agreement, IPCC, GCOS, WCRP, EU Green Deal etc

THE IMPLEMENTATION: CONTRACTUAL STRUCTURE



PHASE 2

THEME 1: New Essential Climate Variables

9 ECVs addressed: Water Vapour, Salinity, Sea State, Snow, Permafrost, HR Land Cover, Lakes, Biomass, Land Surface Temperature; pre-cursor for new ECVs

Direct negotiation starting Q2/2021/ ITT for pre-cursor studies

THEME ii) Additional R&D on ECVs included in CCI

13 ECVs addressed: Aerosol, Cloud, Fire, Glaciers, GHG, Ice sheet Antarctica, Ice Sheet Greenland, Land Cover, Ocean Colour, Ozone, Sea Ice, Sea Level, Sea Surface Temperature, Soil Moisture

ITT in Q2/2022

THEME iii) Cross-ECVs

Climate Modelling User Group, IMBIE project office, SLBC-2, RECCAP-2, 1st and 2nd CCI Fellowship call

Direct negotiation (CMUG, IMBIE, RECCAP), ITT (SLBC-2, CCI fellowship)

THEME iv) Knowledge Exchange

Open data portal, communication, education, webpage and App, toolbox

Direct negotiation Q1/2 2022

Preparing the new climate programme

EO support for UNFCCC Paris Agreement

TBD



26 November 2020: **CCI mid-term review with PBE0**

- Review implementation of programme and achievements
- Gather feedback and recommendations from member states
- Present plan for CCI+ phase 2 and first ideas for new climate programme

February 2021: **PB-EO paper on CCI+**

- Implementation of CCI+ phase 2
- Outline for new climate programme to be presented in 2022

March/April 2021: **AC/IPC paper on CCI+ phase 2**

- Procurement approach for CCI+ phase 2

April 2021: **Implementation of CCI+ phase 2 starts**

- Immediate activity: Theme i) “new” ECVs: direct negotiation to start in April 2021

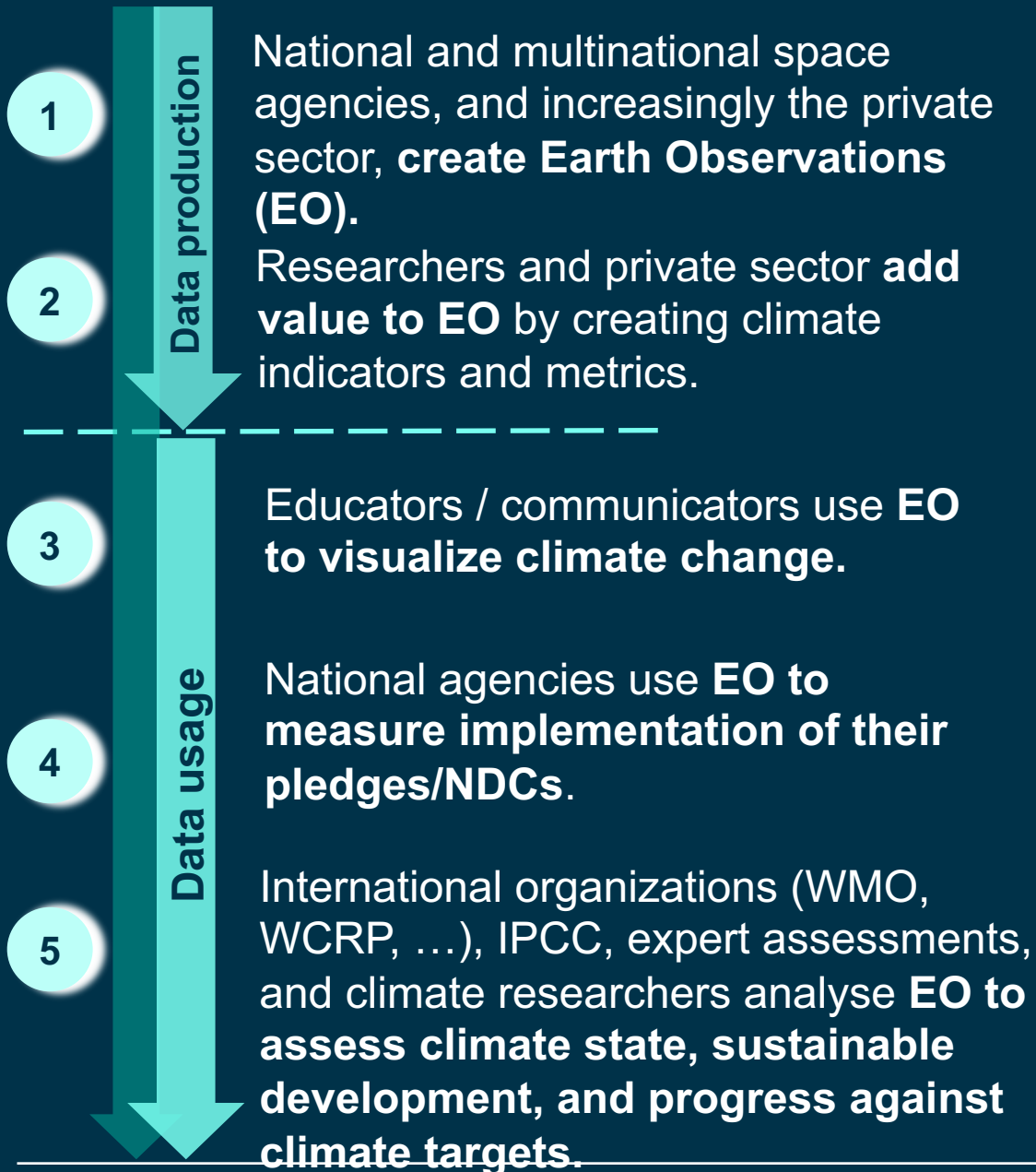
End 2022: **Towards the new climate programme**

- Continue external consultation process (Climate Science Advisory Board, CMUG, European Space Policy Institute, workshops etc)
- Coordinate overall approach to ESA climate activities for CM-22



TOWARDS THE NEW CLIMATE PROGRAMME

VALUE CYCLE OF EARTH OBSERVATIONS FOR CLIMATE



Public engagement



Enhanced Transparency Framework



Global Stocktake



- Mitigation
- Sinks & reservoirs
- Adaptation
- Loss & damage
- Capacity building

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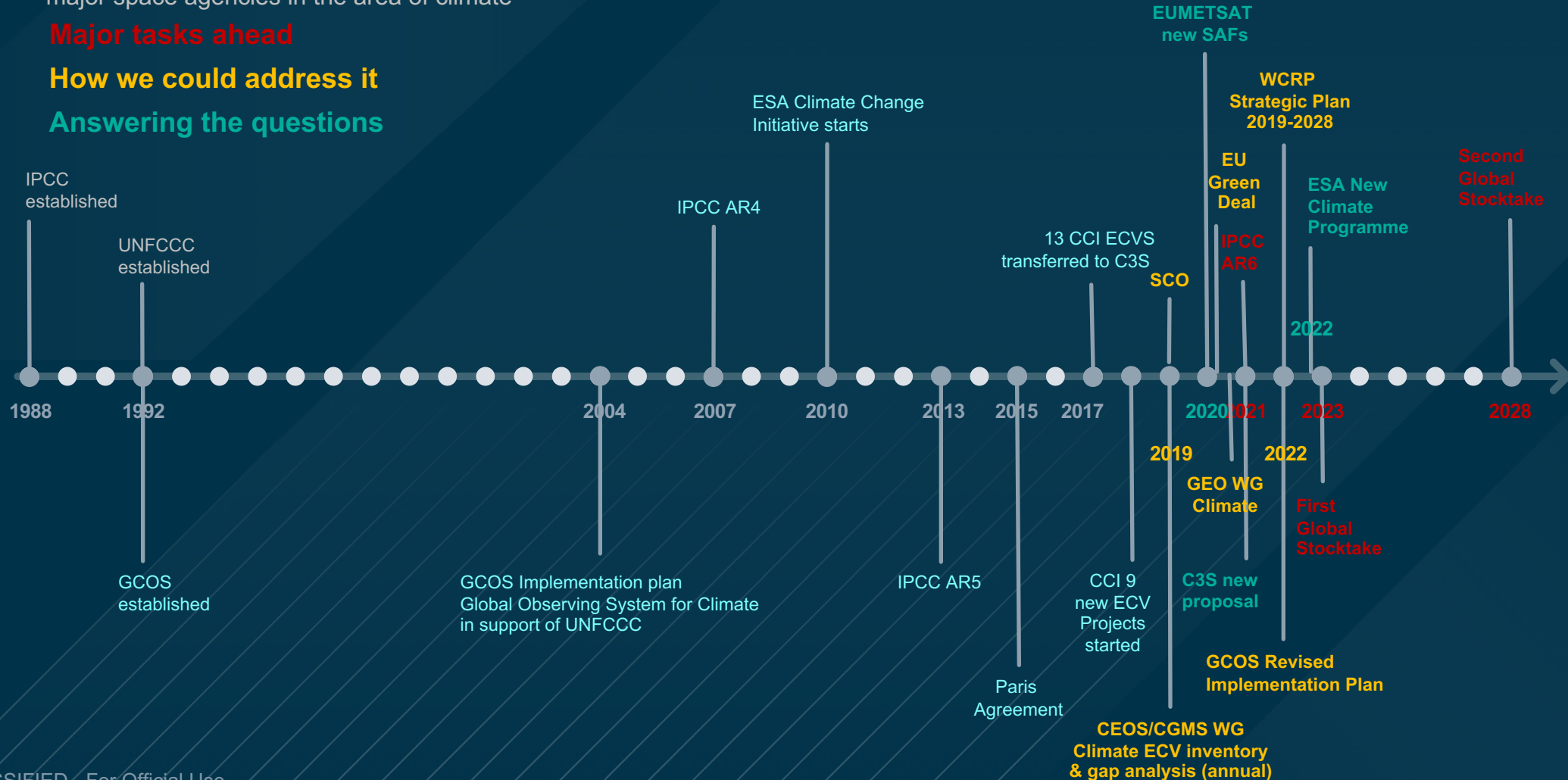
DEVELOPMENTS IN CLIMATE RESEARCH AND SYSTEMATIC OBSERVATION - PAST AND FUTURE

CEOS Working Group to encourage collaboration between major space agencies in the area of climate

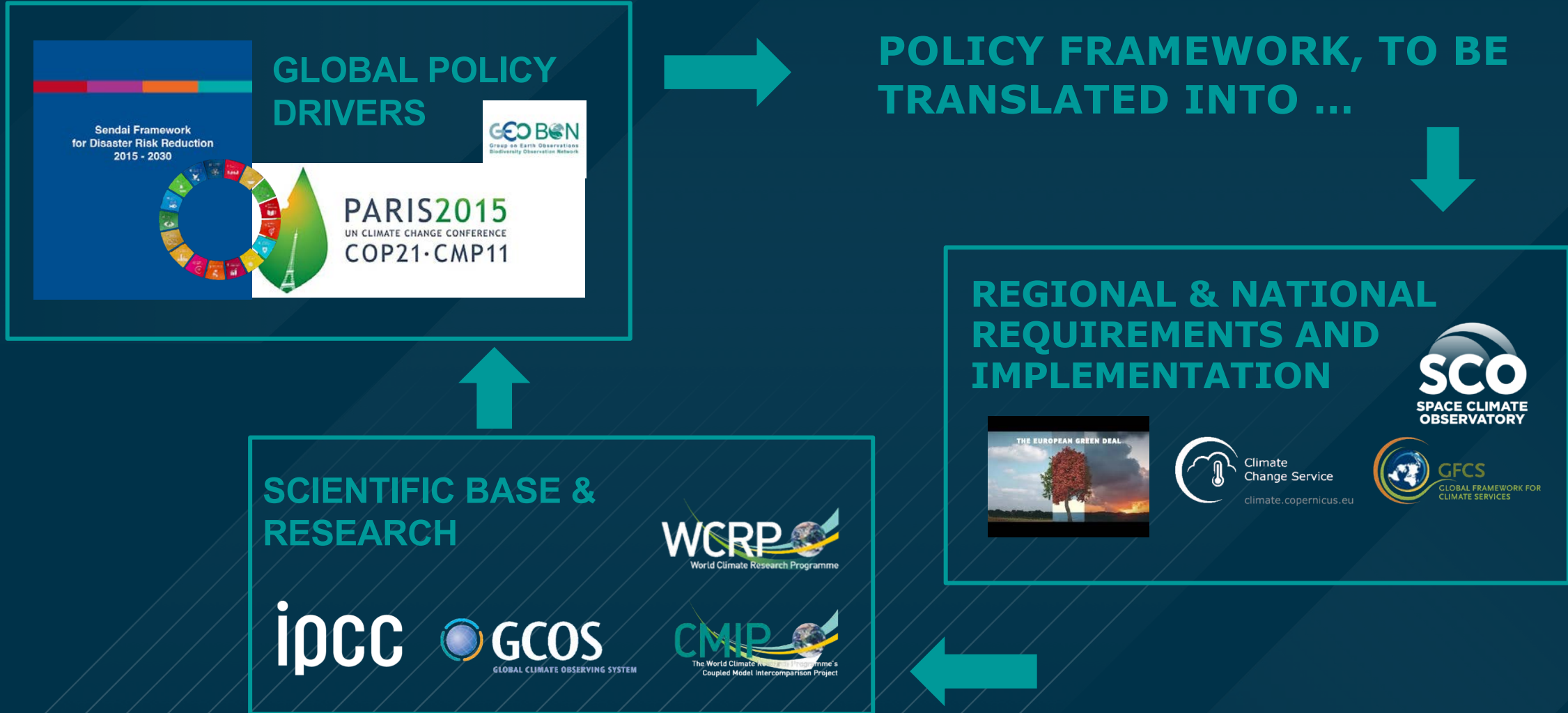
Major tasks ahead

How we could address it

Answering the questions



MAIN DRIVERS FOR THE NEW CLIMATE PROGRAMME



Policy



Provide scientific evidence to support evolution of policy

Global

Support to and guidelines for regional implementation



Support European climate services in providing information for adaptation and mitigation measures

Regional

National implementation and reporting



Data for assessing National Determined Contributions, national emission reporting, adaptation and mitigation measures

National

DEDICATED FEEDBACK

- Climate **Modelling** User Group: “Foresight Report”: high level requirements for the use of EO in climate research and services, led by Richard Jones, UK Met Office, IPCC AR6 lead author. **on-going**
- RECCAP-ESA: feasibility of producing updated estimates of GHG balance anomalies (natural and anthropogenic) at country level constrained by EO & dialogue with national inventory agencies, **link to EU’s CHE/COCO-2/VERIFY on-going**
- Study on the potential for “EO support to the **UNFCCC Paris Agreement**”: case studies and network of leading experts to define R&D agenda. **on-going**
- European Space Policy Institute (ESPI) Horizon study: EO-based climate data to support **climate policies in Europe starts in Jan 2021**
- Tipping Points** in the Earth’s Climate, Forum at ISSI, Bern, 27-29 January 2021, With Future Earth AIMES project **in Jan 2021**
- CCI-C3S collaboration** on common R&D

Conclusion: "EO plays a critical role underpinning climate change research and providing information relevant to intl. and national policies and action on climate change."



Dedicated sessions on

- CCI's contribution to international climate initiatives
- Cross-ECV – from current to future activities, lessons learned and setting priorities for future activities
- Earth Observation for UNFCCC Paris Agreement
- AI Contribution to Climate Data and Modelling
- Collaboration between CCI and C3S
- Evolution of CCI into phase 2 and beyond to a new ESA Climate programme - the views of the Science Leaders

... “Recommended science gaps for **CCI & AI** – Teleconnections, Explainable AI, Inferring Precipitation, Cloud Masking, Intelligent Gap Filling, Water Cycle Change Prediction, Atmospheric ECVs & Ground Phenomena, Extreme Weather Events & Climate.” ...

... “Science Leads’ feedback on **cross-ECVs**: High interest from our climate community for:

- Lateral connectivity – fluxes
- Coastal interface
- Consistency study on regional water cycle closure/budget (using CCI ECVs but not only)”

Feedback from all sessions available online www.climate.esa.int

INTEGRATION

- Joined-up thinking: Earth System approach focussing on ECV Clusters across individual ECV communities and Future Earth's "tipping points"
- Support2Society: Provide scientific evidence to IPCC and provide EO support to UNFCCC Paris Agreement, addressing adaptation and mitigation

INNOVATION

- Based on advances in Earth System Modelling & new observation data
- Extend the CCI "community": Reach out to emerging user communities: Biodiversity, Vegetation, Health
- Expand work with modelling community to connect models and observations
- Explore new techniques for climate research: AI for Climate
- Quantify future trends of climate change

EXCELLENCE

- A climate base to build on: trust and excellence
- Continued custodianship for climate data records: R&D, cross-ECV consistency, uncertainty characterisation, validation
- Transfer to operational services



- 1. Evolution of the CCI+ programme:** based on current activities and achievements, how do you see the continuation and expansion of the CCI+ programme in the future, what should be the future focus of this programme, which activities would you recommend to be addressed in the future?

- 2. ESA's contribution to climate activities in a wider context:** looking beyond the immediate focus of the CCI+ programme, what other activities would you recommend ESA should focus on in future with relevance to climate activities? These might include climate research, monitoring, modelling, global climate policy, support to policy makers on national and regional level, addressing adaptation and mitigation.

Are you ready to discover more?



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BACKUP SLIDES



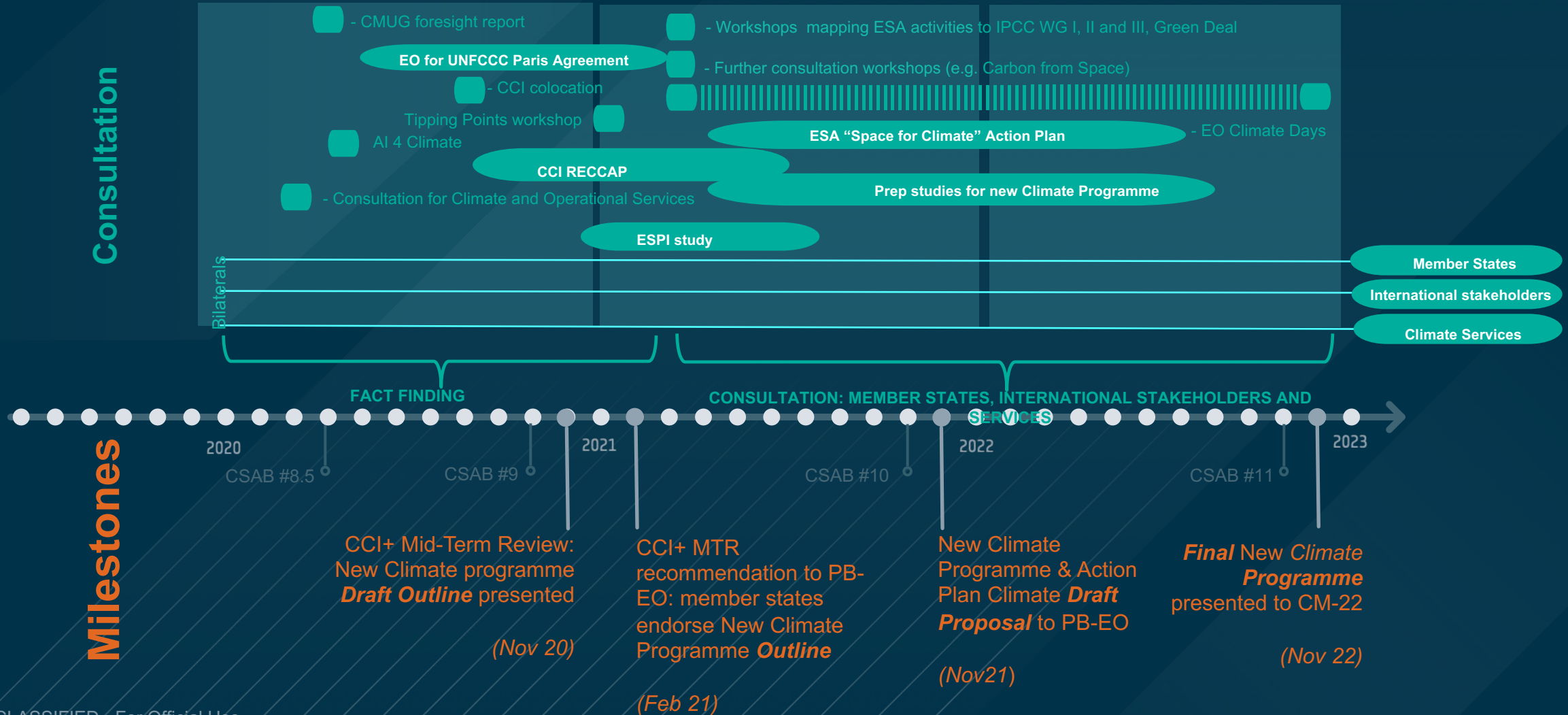
Implementation status CCI+ phase 1/ phase 2



Contract	CCI+ phase 1 Start	End	CCI+ phase 2 Procurement
Theme i) New ECVs and additional precursor project for new ECVs	mid 2018	mid-2021	Direct negotiation, RFQ in Q1/2 202 for existing, ITT for pre-cursor studies
Theme ii) R&D for existing ECVs	Q2/3-2019	mid 2022	ITT, release Q3/4 2021
Theme iii) Cross-ECV			
<i>CMUG</i>	10-2018	09-2022	direct negotiation, RFQ in Q2/2022
<i>IMBIE PO</i>	04-2020	03-2023	Phase 2: TBD
<i>SLBC-2</i>			ITT in Q4 2020 + 2 years
<i>RECCAP-2</i>	06-2020	12-2021	Phase 2: TBD
<i>CCI fellowship</i>			
<i>1st call (May 2020)</i>	Q1 2021	2 years	
<i>2nd call (May 2023)</i>			Q1 2024 + 2 years
<i>Additional activities</i>			ITT in 2021
Theme iv) Knowledge Exchange	09-2019	08-2022	direct negotiation, Q1/2 2022
Preparing for new climate programme			Pilot and demonstrator studies to start asap



Consultation process



Based on dedicated workshops on

- R&D Gap Analysis and common interests
- Joint ESA-C3S Data Standards for Satellite-Based ECVs
- Dataset Mapping Between C3S & CCI
- Harmonising C3S & CCI Toolboxes Workflows

Main points of discussion for common R&D focus on

- Including experience from “new” ECVs: biomass, permafrost and LST
- Link to modelling: root-zone soil moisture, vegetation
- New topics: vegetation, biodiversity, terrestrial hydrology/ river discharge
- Detailed summary note available, base for new C3S and CCI activities

