Way forward for CCI+ phase 2 & elements of a new climate programme
IMPLEMENTATION OF CCI+ PHASE 2
### FOCUS 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 (NOx, SOx), 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; precursor for new ECVs

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

THEME iii) Cross-ECVs
Climate Modelling User Group, IMBIE project office, SLBC-2, RECCAP-2, 1st and 2nd CCI Fellowship call

THEME iv) Knowledge Exchange
Open data portal, communication, education, webpage and App, toolbox

Preparing the new climate programme
EO support for UNFCCC Paris Agreement

Direct negotiation starting Q2/2021/ ITT for precursor studies

ITT in Q2/2022

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

Direct negotiation Q1/2 2022

TBD
SCHEDULE

26 November 2020: **CCI mid-term review with PBEO**
- 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
National and multinational space agencies, and increasingly the private sector, create Earth Observations (EO).

Researchers and private sector add value to EO by creating climate indicators and metrics.

Educators / communicators use EO to visualize climate change.

National agencies use EO to measure implementation of their pledges/NDCs.

International organizations (WMO, WCRP, …), IPCC, expert assessments, and climate researchers analyse EO to assess climate state, sustainable development, and progress against climate targets.
**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**

- **1988-1992**: IPCC established, UNFCCC established, GCOS established
- **2004**: GCOS Implementation plan Global Observing System for Climate in support of UNFCCC
- **2007**: IPCC AR4
- **2010**: ESA Climate Change Initiative starts, 13 CCI ECVs transferred to C3S
- **2013**: IPCC AR5
- **2015**: CCI 9 new ECV Projects started, Paris Agreement
- **2017**: C3S new proposal
- **2019**: GCOS Revised Implementation Plan
- **2020-2021**: CEOS/CGMS WG Climate ECV inventory & gap analysis (annual)
- **2022**: GEO WG Climate
- **2022**: Second Global Stocktake
- **2023**: ESA New Climate Programme
- **2028**: WCRP Strategic Plan 2019-2028
- **2028**: EUMETSAT new SAFs

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MAIN DRIVERS FOR THE NEW CLIMATE PROGRAMME

GLOBAL POLICY DRIVERS

SCIENTIFIC BASE & RESEARCH

POLICY FRAMEWORK, TO BE TRANSLATED INTO ...

REGIONAL & NATIONAL REQUIREMENTS AND IMPLEMENTATION
Policy

Support to and guidelines for *regional* implementation

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

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

Global

Regional

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."
CCI COLOCATION MEETING

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


… “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
DRAFT OUTLINE: NEW CLIMATE PROGRAMME

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
NEXT: PANEL DISCUSSION FOCUSSING ON

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?

www.esa.int
BACKUP SLIDES
### Implementation status CCI+ phase 1/ phase 2

<table>
<thead>
<tr>
<th>Contract</th>
<th>CCI+ phase 1 Start</th>
<th>End</th>
<th>CCI+ phase 2 Procurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme i) New ECVs and additional precursor project for new ECVs</td>
<td>mid 2018</td>
<td>mid-2021</td>
<td>Direct negotiation, RFQ in Q1/2 202 for existing, ITT for pre-cursor studies</td>
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<td>Theme ii) R&amp;D for existing ECVs</td>
<td>Q2/3-2019</td>
<td>mid 2022</td>
<td>ITT, release Q3/4 2021</td>
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<tr>
<td>Theme iii) Cross-ECV</td>
<td>10-2018, 04-2020, 06-2020, Q1 2021</td>
<td>09-2022, 03-2023, 12-2021, 2 years</td>
<td>direct negotiation, RFQ in Q2/2022 Phase 2: TBD ITT in Q4 2020 + 2 years Phase 2: TBD Q1 2024 + 2 years ITT in 2021</td>
</tr>
<tr>
<td>Theme iv) Knowledge Exchange</td>
<td>09-2019</td>
<td>08-2022</td>
<td>direct negotiation, Q1/2 2022</td>
</tr>
<tr>
<td>Preparing for new climate programme</td>
<td></td>
<td></td>
<td>Pilot and demonstrator studies to start asap</td>
</tr>
</tbody>
</table>
**Consultation process**

- **CCII+ Mid-Term Review:** New Climate programme Draft Outline presented (Nov 20)
- **CCI+ MTR recommendation to PB-EO:** member states endorse New Climate Programme Outline (Feb 21)
- **New Climate Programme & Action Plan Climate Draft Proposal** to PB-EO (Nov 21)

Final New Climate Programme presented to CM-22 (Nov 22)

**Milestones**

- **2020:** CSAB #8.5
- **2021:** CSAB #9, CSAB #10
- **2022:** CSAB #11
- **2023:**

**Consultation**

- CMUG foresight report
- EO for UNFCCC Paris Agreement
- CCI colocation
- Tipping Points workshop
- AI 4 Climate
- CCI RECCAP
- Consultation for Climate and Operational Services
- ESPI study
- Workshops mapping ESA activities to IPCC WG I, II and III, Green Deal
- Further consultation workshops (e.g. Carbon from Space)
- EO Climate Days
- Prep studies for new Climate Programme
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