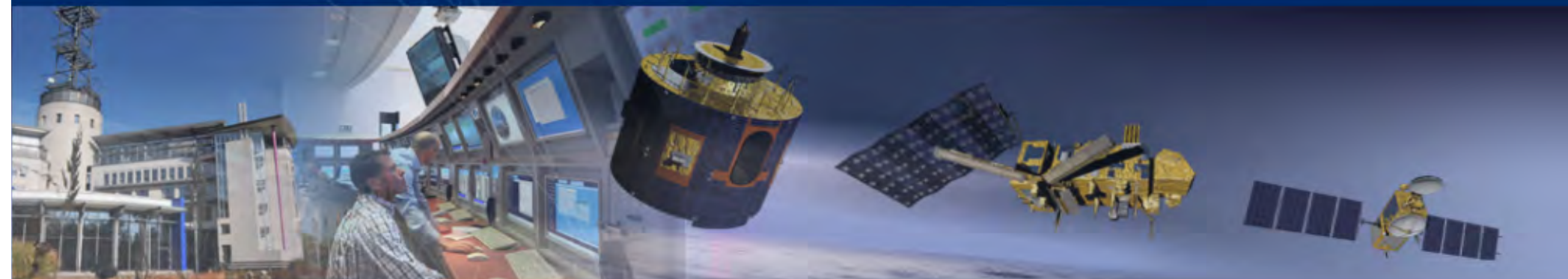




EUMETSAT

Monitoring weather and climate from space



Ocean colour activities at EUMETSAT

Anne O'Carroll

Outline

- **EUMETSAT overview and objectives**
- **Oceanography at EUMETSAT**
- **OSI-SAF, Post-EPS, MTG**
- **Ocean Group**
- **GMES Sentinel-3**

A banner at the top of the slide features a row of various national flags above a stylized image of the Earth from space. The text 'EUMETSAT objectives' is overlaid on the left side of the banner in white.

EUMETSAT objectives

- **The primary objective is to establish, maintain and exploit European systems of operational meteorological satellites.**
- **A further objective is to contribute to the operational monitoring of the climate as well as the detection of global climatic changes.**
- **Furthermore, environmental issues which drive or are driven by meteorological conditions are considered.**

A banner at the top of the slide features a row of 24 national flags representing EUMETSAT's member states. Below the flags is a view of the Earth from space, showing the curvature of the planet and the atmosphere. The text 'EUMETSAT's mission is....' is overlaid on the left side of the banner in a white, sans-serif font.

EUMETSAT's mission is....

- **To deliver operational satellite data and products that satisfy the meteorological and climate data requirements of its Member States - 24 hours a day, 365 days a year, through decades.**
- **This is carried out taking into account the recommendations of the World Meteorological Organization (WMO).**
- **Operational oceanography and atmospheric composition monitoring.**



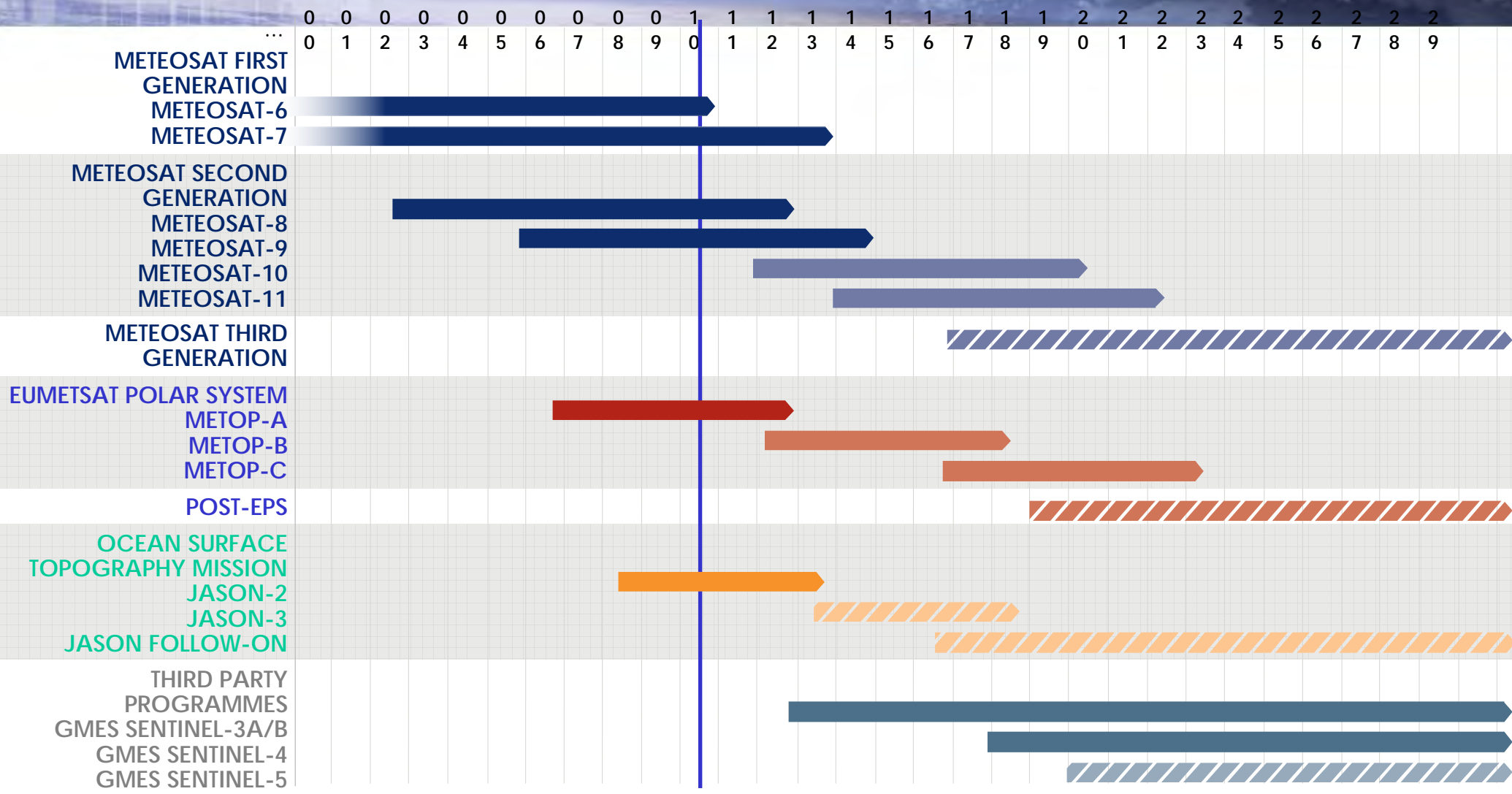
EUMETSAT Strategy: 2030

- **Continuation of Mandatory Programmes (MSG, EPS) and future (MTG, Post EPS): including observations of SST or sea surface winds**
- **Continuation of EUMETSAT Ocean Surface Topography Mapping Optional Programme (Jason-3 and preparation of a post Jason-3 programme): uninterrupted sea level rise monitoring data set.**
- **Participation of EUMETSAT in key ocean observation Programmes such as GMES Sentinel 3**
- **Access to relevant data from third-parties (preparation of Agreements with ISRO and SOA): EUMETSAT seeking access**

EUMETSAT missions



30





EUMETSAT Oceanography

- **Sea Surface Temperature:**
 - OSI-SAF, EPS (AVHRR, IASI), MSG (SEVIRI), Sentinel-3 (SLSTR), members of GHRSSST science team, ERNESST
- **Wind:**
 - OSI-SAF, EPS (ASCAT), ASCAT SAG (with ESA), Oceansat-II agreement, ASCAT soil moisture
- **Altimetry (3rd party missions):**
 - JASON, Sentinel-3 (SRAL)
- **Ocean-colour: Sentinel-3 (OLCI)**
- **Other: OceanObs09, MyOcean, OSI-SAF, Future Missions**

The banner features a background image of a satellite ground station building on the left and a view of Earth from space on the right. A horizontal row of various national flags is positioned across the top of the banner.

EUMETSAT MET Division Ocean Group

- **MET/Ocean provides Ocean Scientific Support to OPS, MOD, LEO, GEO**
- **Ocean group (MET division)**
 - Hans Bonekamp (Ocean Mission Scientist)
 - Craig Anderson (ASCAT calibration)
 - Anne O'Carroll (Ocean Scientist)
 - **New recruit (Optical Scientist) See EUMETSAT/IOCCG webpage for vacancy details. Closing date: 14th Nov 2010**

Ocean and Sea-Ice Satellite Application Facility (hosted by Meteo-France)



<http://www.osi-saf.org>

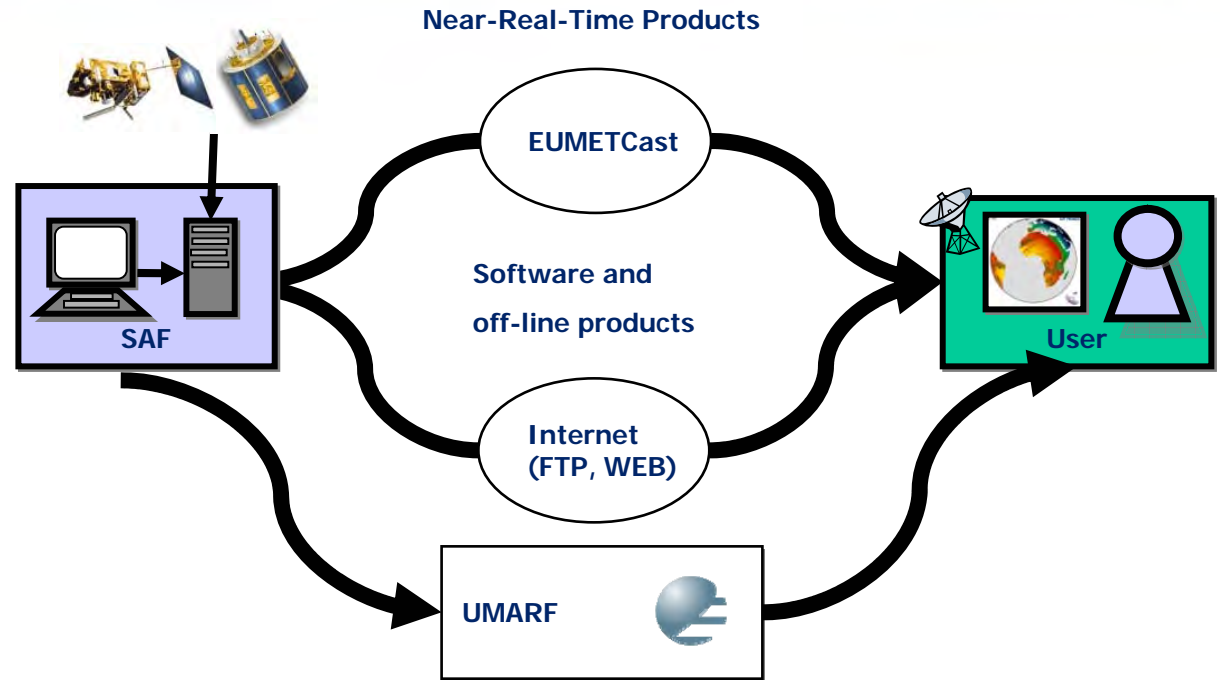
Products:

Wind, SST, Sea-Ice,
Radiative fluxes

Sensors:

AVHRR, SEVIRI,
ASCAT, (SSMI,
AMSR-E, GOES-R)

Preparations for the next phase 2012 -2017 are
ongoing





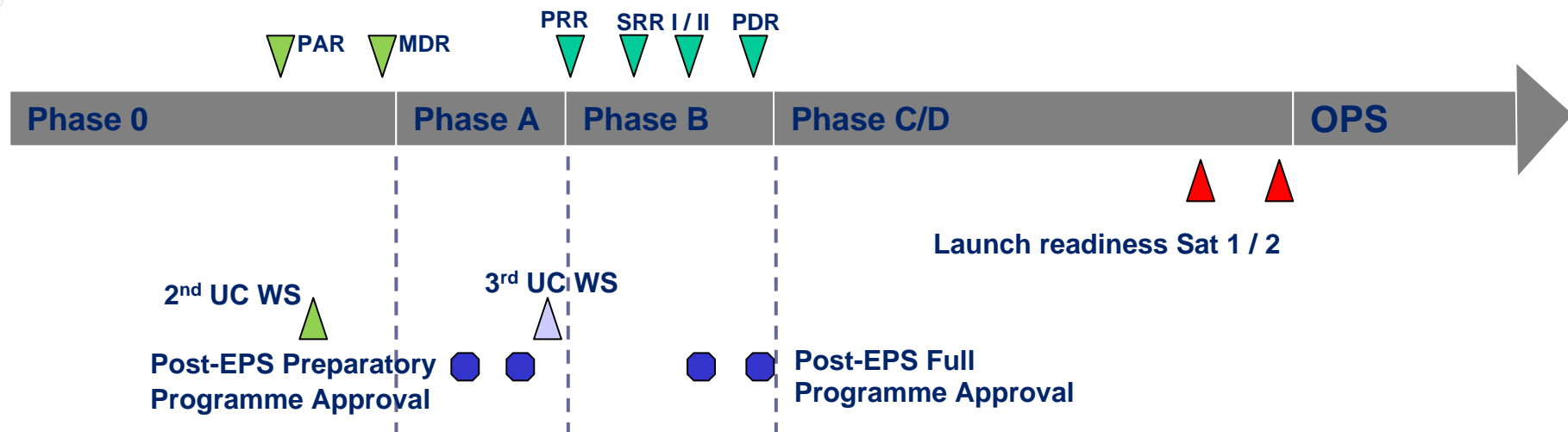
Post-EPS Candidate Missions: End of Phase 0

Mission	Approach
High-Resolution Infrared Sounding (IRS)	Phase 0 Study by ESA and CNES, Phase A study by CNES (IASI-NG)
Microwave Sounding (MWS)	Phase 0/A Studies by ESA, Accommodation of ATMS (NOAA)
VIS/IR Imaging (VII)	Phase 0 Study by ESA, Accommodation of DLR <i>METImage</i>
Scatterometry (SCA)	Phase 0/A Studies by ESA
Radio Occultation Sounding (RO)	Phase 0/A Studies by ESA
Nadir viewing UV/VIS/NIR/SWIR Sounding (UVNS)	GMES Sentinel-5 accommodation
Microwave Imaging - Precipitation and Cloud (MWI)	Phase 0/A studies by ESA
Multi-viewing, -channel, -polarisation Imaging (3MI)	Phase 0/A studies by ESA
Radiant Energy Radiometry (RER)	Accommodation of CERES (NOAA)
Low Light Imager (LLI)	Accommodation of LLI (NOAA)
Space Environment Monitor for NPOESS (SEM-N)	Accommodation of SEM-N (NOAA)
Data Collection System (DCS)	Accommodation of ARGOS (CNES)
Search & Rescue (S&R)	Accommodation SAR (COSPAS SARSAT / NOAA)
Radar Altimetry (ALT)	GMES Sentinel-3, JASON f/o
Dual View Radiometry (DVR)	GMES Sentinel-3
Ocean Colour Imaging (OLCI)	GMES Sentinel-3
Microwave Imaging - Ocean and Land	Phase 0 Study by ESA, not retained, demonstration by SMOS for 1.4 GHz
Doppler Wind Lidar (DWL)	Not retained, demonstration by ADM
Aerosol Profiling Lidar (APL)	Not retained, demonstration by ADM
Cloud and Precipitation Profiling Radar (CPR)	Not retained, demonstration by EarthCare
Total Solar Irradiance Monitoring (TSIM)	Not retained, one instrument on NOAA satellite sufficient
Limb Infra-Red Sounding (LIR)	Not retained - lack of operational demonstration
Limb Millimetre-Wave Sounding (MMW)	Not retained - lack of operational demonstration
Differential Absorption Lidar (DIA)	Not retained - lack of operational demonstration

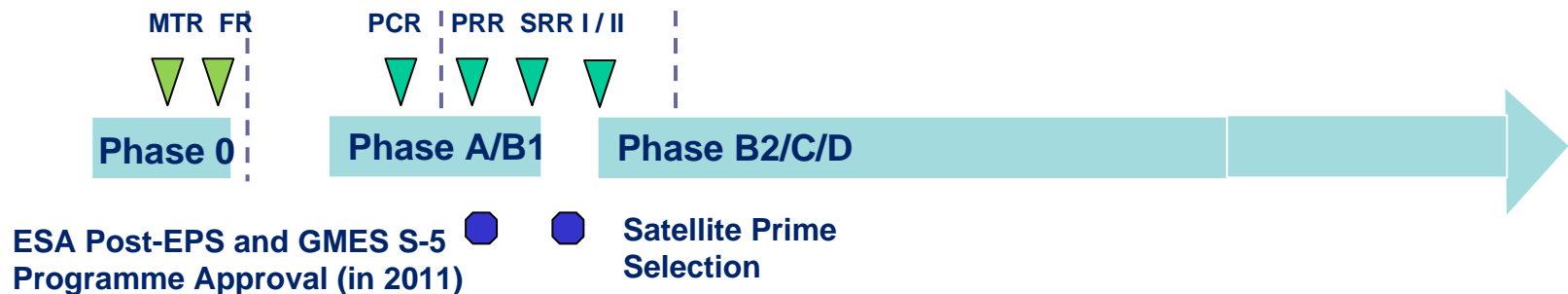
Post-EPS Programme Master Schedule



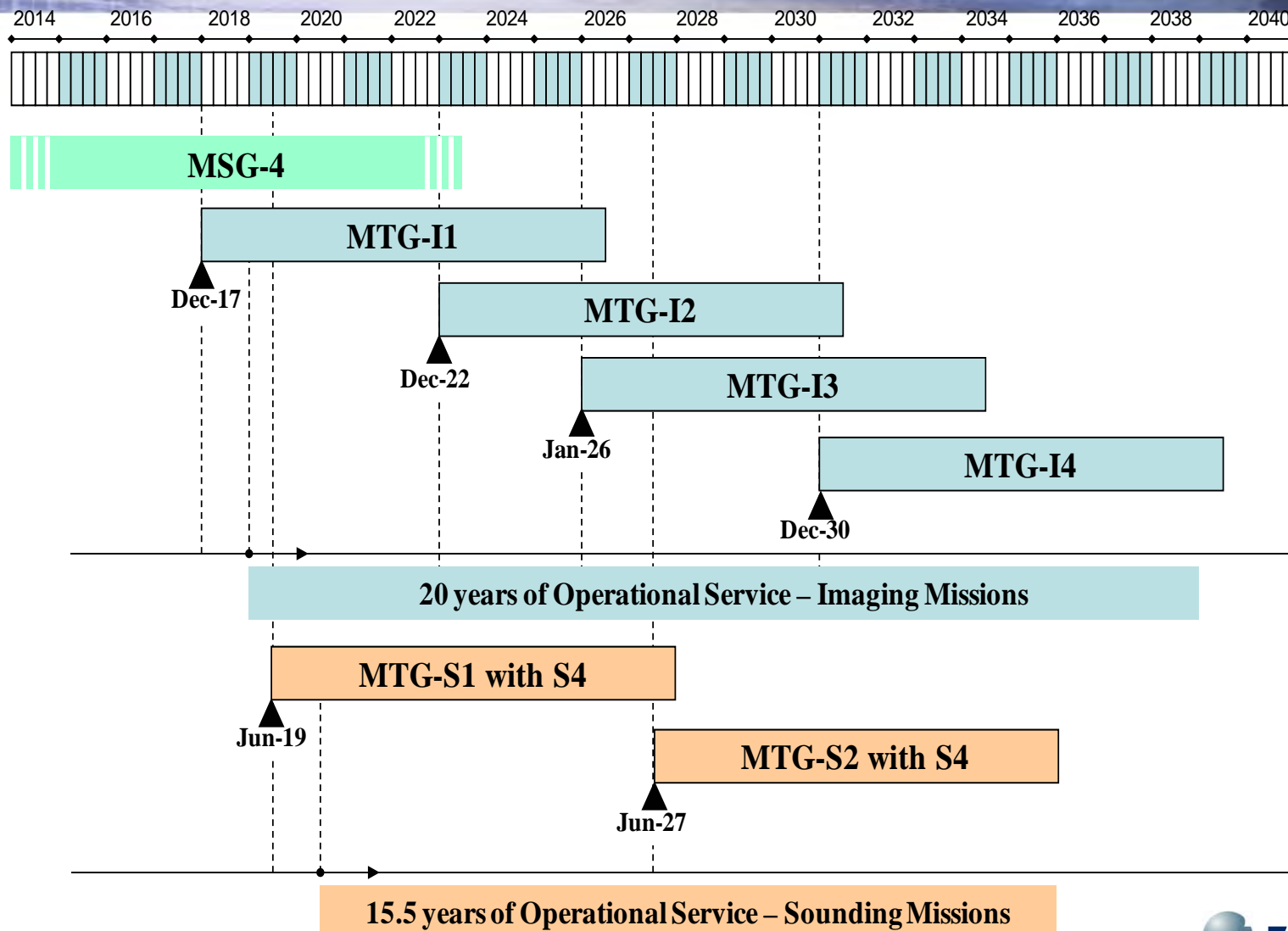
EUMETSAT Post-EPS Phasing



Satellites Development



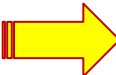
MTG in Orbit Deployment Scenario




MTG Provides a Total of Five Missions Compliant to the User Needs

 **Full Disk High Spectral resolution Imagery (FDHSI)**, global scales (Full Disk) over a BRC = 10 min, with 16 channels at spatial resolution of **1 km (8 solar channels)** and **2 km (8 thermal channels)**

 **High spatial Resolution Fast Imagery (HRFI)**, local scales (1/4th of Full Disk) over a BRC = 2.5 min with 4 channels at high spatial resolution **0.5 km (2 solar channels)**, and **1.0 km (2 thermal channels)**

 **InfraRed Sounding (IRS)**, global scales (Full Disk) over a BRC = 60 min at spatial resolution of 4 km, providing hyperspectral soundings at 0.625 cm⁻¹ sampling in two bands: **Long-Wave-IR (LWIR: 700 – 1210 cm⁻¹ ~ 820 spectral samples)** and **Mid-Wave-IR (MWIR: 1600 – 2175 cm⁻¹ ~ 920 spectral samples)**

 **Lightning Imagery (LI)**, global scales (80% of Full Disk) detecting and mapping continuously the optical emission of cloud-to-cloud and cloud-ground discharges. Detection efficiency between DE=90% (night) and DE=40% (overhead sun)

Sentinel-3 GMES agreement: EU/ESA/EUMETSAT



- **Global Monitoring for Environment and Security (GMES) – Sentinel-3 Programme is co-funded by ESA and EC**
 - **A third party Sentinel-3 Programme has been established at EUMETSAT**
- **ESA is leading the development of the S3 Ground and Space segments; EUMETSAT is supporting the Ground Segment development through ESA/EUMETSAT integrated teams and collaborative activities.**
- **The Payload Data Ground Segment (PDGS) will be distributed: ESA will be responsible for producing land L2 products, while EUMETSAT will be responsible for producing the marine L2 products. Data will be disseminated from both agencies.**





The EUMETSAT Sentinel-3 Project Team (25 people)

Project Manager: Dany Provost



Sys&PreOps: Marco Buemi

PDGS: Hilary Wilson

MME: Michel Horny

FOS: Robert Cunningham



Sentinel-3 Marine data dissemination at EUMETSAT

- **Data dissemination of marine products:**
 - **Operational Near-real time**
 - **Freely available**
 - **Full resolution data over whole globe**
- **Marine data distributed from EUMETSAT via:**
 - **EUMETCAST**
 - **UMARF**
 - **Online rolling archive**
- **EUMETCAST robust and thoroughly tested system (used for Meteosat & EPS data dissemination)**



EUMETSAT Sentinel-3 current activities

PDGS – KO meeting with ESRIN/EUM in Sept (WAVE consortium)

System & Ops Prep, FOS, MME activities on-going

Sentinel-3 Mission Advisory Group

- **Convened by ESA; EUMETSAT members**
- **Mission support and advice to agency**
- **First meeting scheduled Nov/Dec at ESTEC**

Launch of Sentinel-3A: Scheduled 13th August 2013



Summary

- **Oceanography an expanding commitment in EUMETSAT**
- **EUMETSAT Sentinel-3 project underway with dedicated team of 25 people**
 - **EUM responsible for L2 marine data processing**
- **Future programs of Post-EPS, MTG, JASON ensure commitment to oceanography continues**