Maximizing the potential of Satellite Earth Observation for the economy, science and society.

A new era: 2017 – 2040

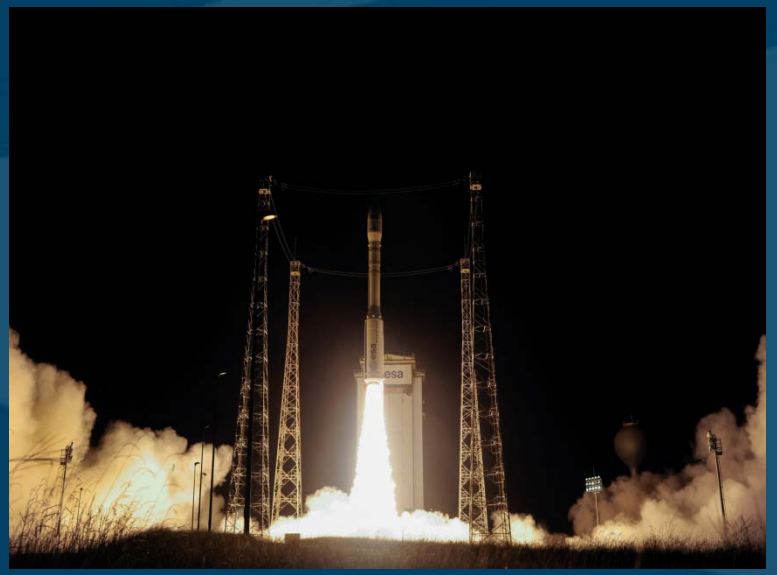
Beth Greenaway,
Head of Earth Observation

30th June 2017

http://www.bis.gov.uk/ukspaceagency

Contents

- UK Space Agency
- Key EO achievements
- A new vision 2017-2040
- Immediate Priorities
- Key programmes needing science and technology



Space in the UK

- £13.7 billion sector
- Employs 38,500+
- 6.5% share of global space economy
- Critical National Infrastructure
- Underpins all other key industrial sectors
    - Agritech
    - Automotive
    - Aerospace
    - Maritime
    - Energy

UK Space Agency

- New Chief Executive:

Graham Turnock

Vision: To support UK industry to capture 10% of the global space market by 2030.

2017-18 KPIs

- Space Growth Strategy / Space Growth Partnership
- Space regulatory reform
- Satellite Launch Programme
- Ground-breaking national and international programmes (including UK leadership role in European Space Agency)

Space Industry Bill

- **The Space Industry Bill is being introduced into the House of Lords.**
- **This is the first step in the parliamentary process to create new laws to enable exciting new technologies to operate safely from the UK.**
- **Introduction of the Bill is a clear signal of the UK's commitment to enabling commercial spaceflight from UK spaceports.**

EO Strategic Implementation Plan

- EO Strategy 2013 – 2016 and

EO Strategic Implementation Plan.

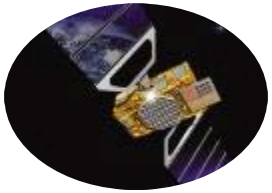
- New plan 2017-2040

- Sits under the
  - National Space Policy,
  - Space Growth Strategy (Industrial Strategy)
  - Accounts for the UKSA EO actions in the Space Growth Partnership

Achievements since June 2015

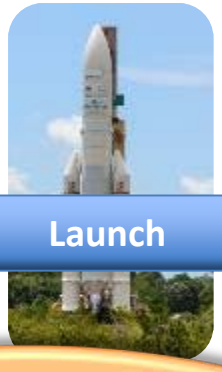
- CMIN16 UK as the lead funder of EO activities in ESA – E285.8m Science case was key - Thank you
- Copernicus influence data and space elements
- French bilaterals
- CEOS / GEO UK office and increased presence
- Climate Data Zone
- Space for Climate
- CEOI 2020
- Ground Segment Vision

UK SPACE AGENCY



Agency Ofcom

Spectrum & Licences



Launch

Academia Industry ESA

Operations

Data & Ground Segment

Agency
RAL
Industry
Non EO data

Space Infrastructure supporting Earth Observation enabled services

Industry ESA Global agencies National

Development

Local & Devolved Administrations

Central Government

Information & Services

Space Enabled markets
General Public
Academia
Industry
Local Government
Space Industry

EU (H2020)
Agency
Research Councils
National
Innovate UK
ESA

Research

A (subtle) changing philosophy

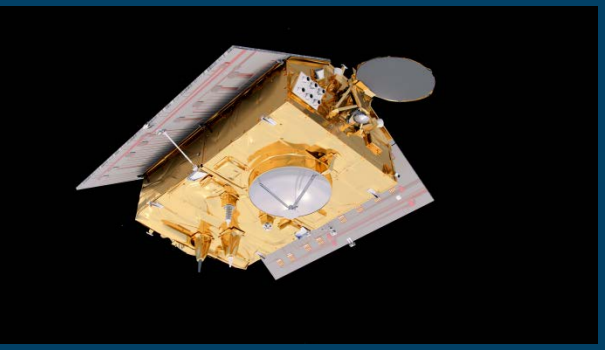
The UK Space Agency is seeking to ensure that the UK's participation in Earth observation is as strong as possible and that it is recognised for the role it can play in delivering a sustainable service based economy.

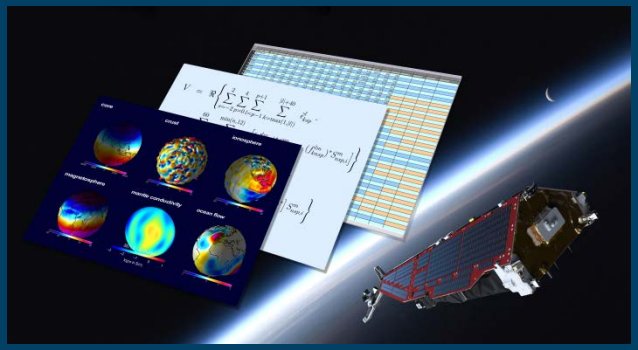
By 2040 satellite Earth Observations will provide the data underpinning mass market and business applications, global cutting edge science and policy and operational decision making.

Therefore ..in setting actions and priorities, we should exploit the fact the UK is the lead funder of EO in the European Space Agency to develop a broad and deep ecosystem of companies big and small dealing in the entire spectrum of earth observation issues from early research and technology development, through manufacture and launch, through the infrastructure and services needed to move, validate ~~check and~~ share and interpret the data into a format suitable for use. We should export EO skills and technologies worldwide, negotiate a new relationship with Copernicus and plug the emerging EO skills gap to fill the jobs that will be created in the UK.

What will EO look like in 2040

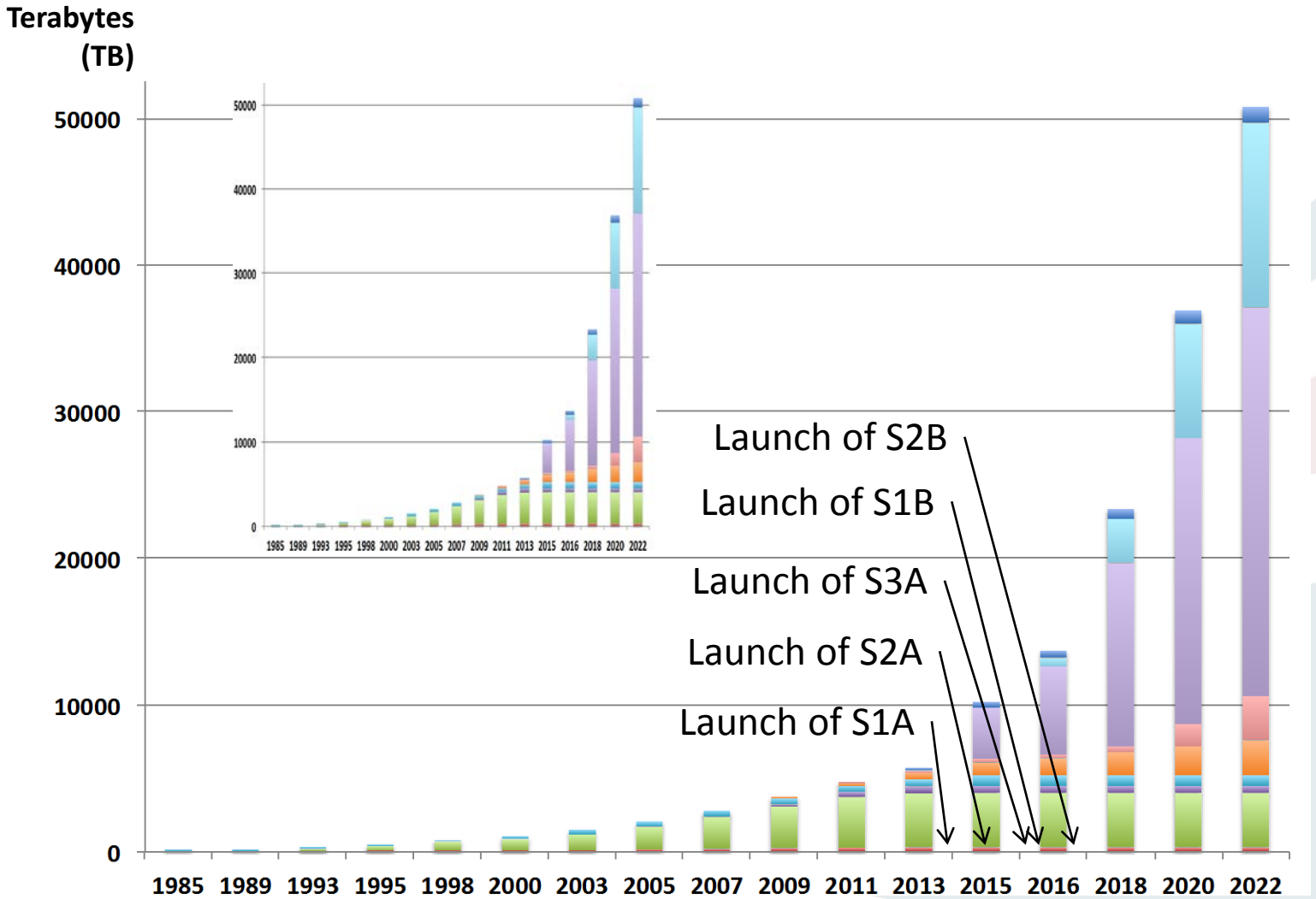
- Missions
- Data use and processing
- Use





2000 Public	Public	Science and Met applications
2040 Public / private	Public / private	Mass markets & Big business/ public policy, Met and science

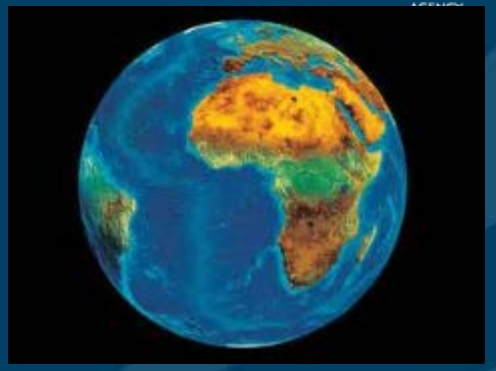
EO Data Volume is increasing



What are the Game changers?

- Data – high res / high frequency / video / commercial constellations
- Digital economy IT / cloud computing / big data analytics
- Brexit – industrial landscape
- Copernicus long term guaranteed operational data
- Space launch capability and UK space port
- International policy
- Etc etc
- PARADIGM SHIFTS IN EO ESA ESRIN 11th May

EO Plan 2017 - 2040



Contents

- What is Earth Observation?
- The Importance of EO
- The future EO market / ecosystem in 2040
- Key partners – global and national
- The UKSA roles
- Key actions and priorities
- Evaluation Plan

Key Priorities 2017-2021

Markets	Technology	Data		
X	X	X	1	Leveraging return from ESA - £ and European positioning
X	X	X	2	Maximising the Opportunities in Copernicus and EU programmes and ensuring optimal data access post Brexit
X	X	X	3	Positioning EO as a fundamental infrastructure and tool underpinning industrial strategy , policy and societal needs
X	X	X	4	Foster global innovation and growth (applications , technology, bilateral etc)
x	x	X	5	Skills and education plan

Thematic Areas

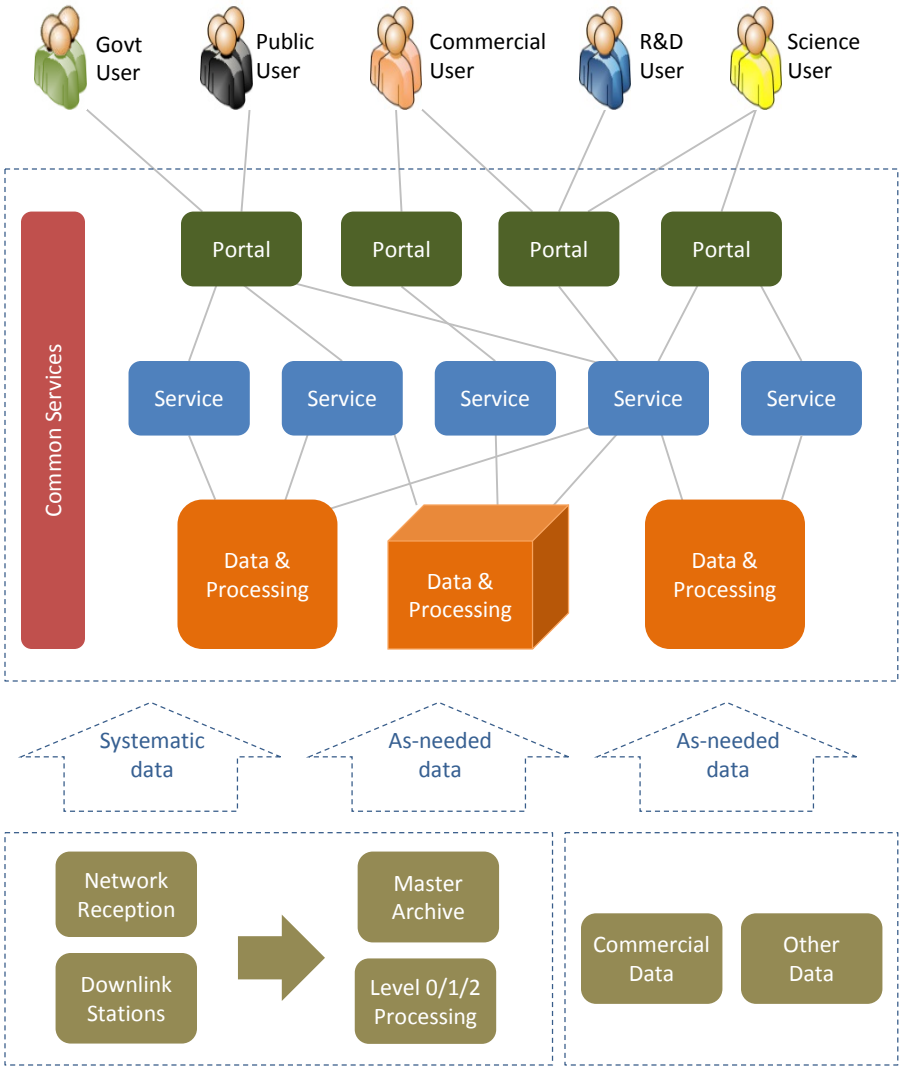
- Markets – from SGP reports
  - Climate services
- Technologies – from CEOI Technology Strategy
- Data Access and Use
  - Creating a sustainable supply via
    - Policy and regulations (CEOS and GEO data groups, ESA and Commission relationships, high res data security policy)
    - bilateral and commercial suppliers relationship,
  - Enabling infrastructure

Data Access and Exploitation Vision

"The UK will be the first choice access point for global users and providers of satellite data, *leveraging the UK's leading roles in Climate Science, Land and Coastal Monitoring* for example,* delivering growth over the long term by maximising the exploitation of EO data and services by public, academic, and private sector users, through a reliable, open, secure and sustainable capability."

*subject to the output of the Space Growth Partnership.

User driven data access system



- Schematic models similar to ESA, EC, and industry
- Driven by *users* need from the ground segment (to do their research, conduct business, set policy etc.)
- All stakeholders should be able to participate and contribute . This implies flexibility and interoperability.
- 4 options under discussion
  - Cost Benefits analysis complete by end March
  - Details and way forward by Summer 2017

Users are served through *portals* which connect them to *services* which make use of underlying *data and processing* infrastructure

Data is collected from satellites and other sources and piped in to this infrastructure, on an operational basis with timely availability.

ESA – The latest

- CMIN 16 Subscription to 3 programmes >E300m Geotreturn basis.
- EOEP5 - £255.8m
  - 4 blocks of activities – see next slide
- CCI+ - £23m
  - Hosted in Harwell Climate Office
  - Info day 6th July – major procurements over this summer
- Incubed –£10m Innovation in EO industry. Close to market. Launch 6th September Harwell.
- LTDP + PV conference in UK 2018
- Earthnet

EOEP5

- Block 1 – EE9 and EE10, mission prep
- Block 2 – Biomass, Flex, EE9
- Block 3 - Operations
- Block 4 - Science and exploitation
  - Data exploitation platforms
  - Sustainable development
  - Open call
  - Smaller pots – big impact eg MOOCs, science applications , science,
- ---- Living Planet 2019
- -----Careers events – EO skills and education
- -----Coms activities

Copernicus

- EU funded programme plus ESA and EUMETSAT

- Part of the Brexit Negotiations
  - Case made – White Paper says ;;;;;;;;;
  - This summer / Autumn key Defra / UKSA /Met Office / NERC
- The programme continues – 5P roll out July , Launch Sept 21st, 3B launch March 2018 / DIAS

- Expansion and evolution phase 2020-2040.
  - S7,8,9,10
  - New regulation – new rules?

Opportunities:

- National Strategy – Sector Deal
- WIDER WORLD –
  - Bilaterals building on Microcarb / SWOT and IASI-NG
  - CEOS and GEO
  - CEOI programme/
  - Commercial eg NovaSAR
  - UKSA current chair of Dissaster Charter

Evaluation Plan

- What will success look like?
- How do we know we are on track?
- How do we collect the evidence on the way?
  - Number of people in EO
  - Value of the EO industry
  - Strategically important returns from ESA EO subscription
  - Awareness of EO and value to society
  - Resilience of EO post Brexit – a broader and deeper community?
  - Science and society value?

How can you be part of this?

- 1. Talk to us – EOAC, pre PBEO, user forum, email
- 2. Persue your ambitions – use the data, grow the sector, up skill your teams etc
- 3. Tell us / tell the world the good news and why EO matters

Finally

@spacegovuk

Essential: EO is an essential component of the infrastructure and contributor of economic growth, data and science.

Exciting: The UK has secured a lead funding position of EO in ESA and we can rightly and proudly grow the sector

Exponential potential: Technology and business models are changing. Partnerships are essential to realize the next generation of science policy and economic benefits EO can bring.