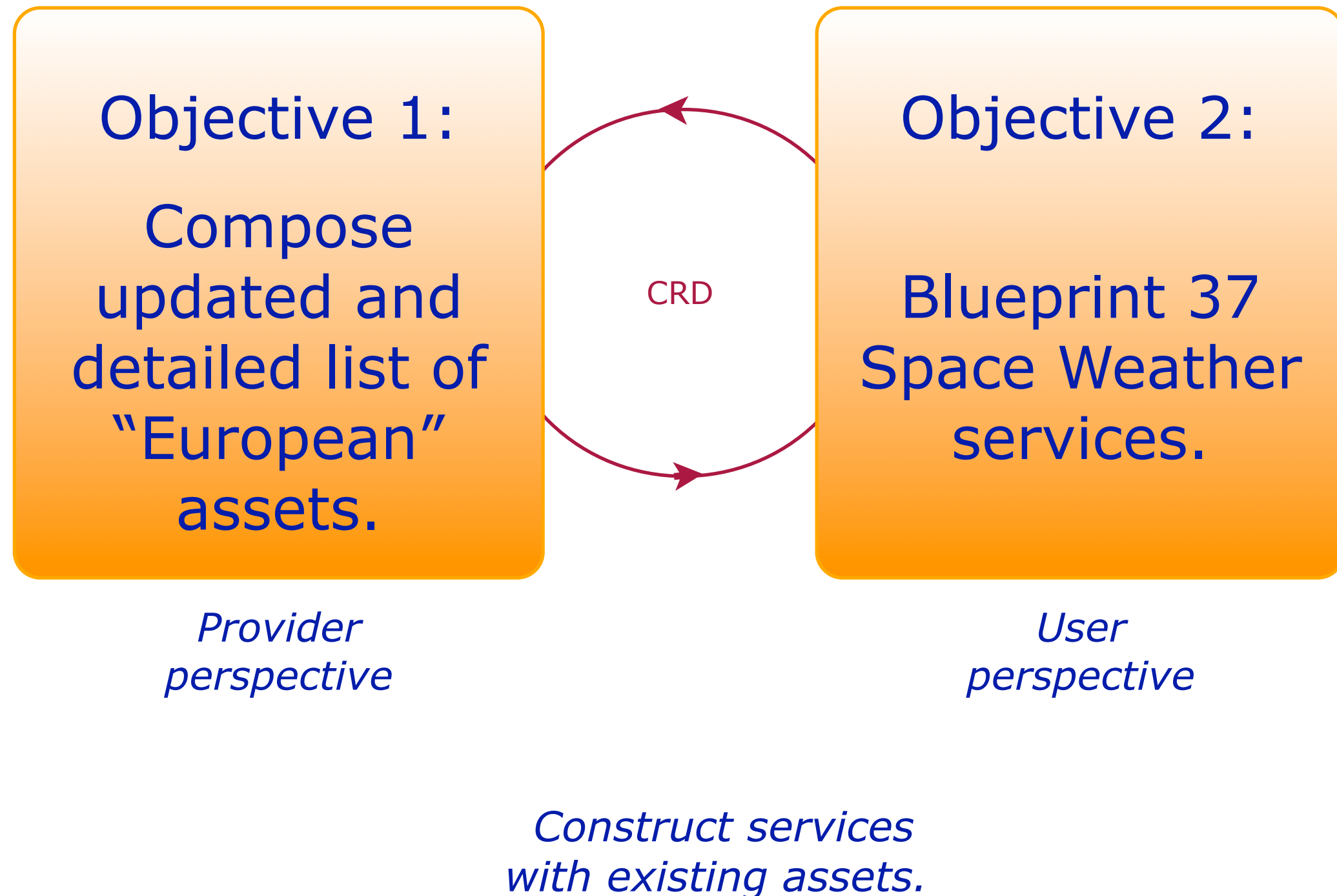


# SWE SSA Asset Database

*Output from ESA SSA SN-I project*  
Eva Robbrecht and the SN-I Task I team



# Two Main Objectives of Task 1



# Objective 1: Compose updated and detailed list of "European" assets.

Main input:  
Asset list (Annex 2) &  
[RD-SWE-ASSETS-DELEG]

## ANNEXE II: TABLE OF SPACE WEATHER ASSETS IN EU AND ESA STATES

### Norway

Asset name	Owner	Operator	Type of asset	Brief description of the asset
EISCAT	International (HQ in Sweden)		Sensor(s)	Radar (Tromsø and Svalbard)
Kjell Henriksen Observatory	UNIS / Svalbard	UNIS	Sensor(s)	Auroral observatory with multiple instrument possibilities
Magnetometer Chain	Univ. of Tromsø	University of Tromsø	Sensor(s)	Chain of magnetometers - provide commercial service
GPS reference stations	Norwegian Mapping Authority	Norwegian Mapping Authority	Sensor(s)	GPS reference station used for geodesy and ionospheric disturbances.
GPS reference stations	Fugro Geotek	Fugro Geotek	Sensor(s)	GPS reference stations to increase accuracy in dynamic GPS positioning (offshore)
All Sky Cameras	Univ. of Oslo	Univ. of Oslo	Sensor(s)	Optical All Sky Cameras at Andøya and Svalbard
Svalbard ground station, SvalSat			Other	
Antarctic ground station, KSAI			Other	
Ionosonde Svalbard and Tromsø			Sensor(s)	
Ionosonde Ny Ålesund			Sensor(s)	
Andøya Rocket Range	Norwegian Space Centre, Kongsberg Defence and Aerospace	Andøya Rocket Range	Other	

### Belgium

Asset name	Owner	Operator	Type of asset	Brief description of the asset
Regional Warning Centre of ISES	Royal Observatory of Belgium	Royal Observatory of Belgium	Service	Warning centre for energetic solar events
World Data Centre for the Sunspot Index	Royal Observatory of Belgium	Royal Observatory of Belgium	Service	Sunspot index service
Data Analysis Service of ICSU/FAGS	Royal Observatory of Belgium	Royal Observatory of Belgium	Service	International Sunspot Number service
Solar Influences Data Analysis Centre (SIDC)	Royal Observatory of Belgium	Royal Observatory of Belgium	Service	monitoring and predicting solar activity
Space Weather Yellow Pages (in SIDC)	Belgian Institute for Space Aeronomy	Royal Observatory of Belgium	Service	www user-friendly tool implementing a centralised, automated retrieval system for space weather data
GNSS user service (in SIDC)	Royal Meteorological Institute	Royal Observatory of Belgium	Service	positional accuracy nowcasting, geomagnetic activity forecasting
NeQuick model for Galileo	Different universities (in B: ULg)	Galileo ground segment	Software	ionospheric correction model for Galileo; B contribution: modelling
SWENET database	Belgian Institute for Space Aeronomy	Etanox (D)	Service	database architecture and visualisation tools
European Space Weather Portal (ESWEP)	COST + Belgian Institute for Space Aeronomy	COST + Belgian Institute for Space Aeronomy	Service	web portal for COST 724 related to space weather awareness
Space Environment Information System (SPENVIS)	Belgian Institute for Space Aeronomy	Belgian Institute for Space Aeronomy	Service	www interface to models of the space environment and its effects
Martian Radiation Environment Models (MarsREM)	Belgian Institute for Space Aeronomy	QinetiQ	Software	Radiation models and engineering tools to predict the Martian radiation environment
PROBA-2 scientific operations centre	Royal Observatory of Belgium	Royal Observatory of Belgium	Service	PROBA-2 data and products service
Geophysical Observatory at Dourbes	Royal Meteorological Institute	Royal Meteorological Institute	Service	ionospheric and geomagnetic nowcasting and forecasting; cosmic ray monitoring
B.USOC	BELSPD	Belgian Institute for Space Aeronomy	Service	Science Operations Centre for PICARD, ISS/SOLSPEC, ISS/SOVIM
Radio Observatory at Humain	Royal Observatory of Belgium	Royal Observatory of Belgium	Sensor(s)	multi-wavelength monitoring of the solar radio emission, <a href="http://sidc.oma.be/humain/">http://sidc.oma.be/humain/</a>
Uccle Solar Equatorial Table (USET)	Royal Observatory of Belgium	Royal Observatory of Belgium	Sensor(s)	optical solar monitoring in white light, H-alpha and Ca II
Energetic Particle Telescope (EPT)	Centre for Space Radiations, UCL	Under Phase C development led by CSR, UCL	Sensor(s)	High-energy particle sensor available for different satellites
Modelling tools for radiation belts, magnetosphere, solar wind	Belgian Institute for Space Aeronomy	Belgian Institute for Space Aeronomy	Software	trapped radiation, plasmasphere, aurora, solar wind discontinuities
Modelling tools for the radiation belts	Centre for Space Radiations, UCL	Centre for Space Radiations, UCL	Software	electron and proton fluxes, ELF and VLF waves, radiation belts
Modelling tools for the magnetosphere	Lab. for Atmospheric and Planetary Physics, ULg	Lab. for Atmospheric and Planetary Physics, ULg	Software	aurora's, substorms, reconnection, etc.
Modelling tools for CME onset and propagation	Centre for Plasma Astrophysics, KUL	Centre for Plasma Astrophysics, KUL	Software	CME propagation from Solar surface (onset) to Earth's magnetosphere
COOLfluid multiphysics				modular environment for modelling solar wind, CME's,

# Collecting assets

Home

Organizations

Add entries  
My entries

Assets

Add entries  
My entries

Reviewer functions

Browse organizations  
Browse assets  
Edit assets  
Review assets  
ESA asset list  
Browse users  
Check asset reviews

CRD analysis

Assign quantities  
DAT/MOD requirements  
Browse DAT/MOD  
PRD requirements  
Browse PRD  
Service requirements  
Browse services

Links

ESA SSA

Login

evarob logged in

Log out

My info

SSA SN-I Asset database

Organization queries

Organization class: legal entity

Select: all

Sort by: name

Query results. Click on the organization name for more detailed information.

Name	Acronym	Type	Country
Aalto University, Metsähovi Radio Observatory		university	Finland
Air Force Research Lab	AFRL	military	United States
AIT Austrian Institute of Technology	AIT	other	Austria
AMSAT-Italia		other	Italy
Andøya Rocket Range	ARR	commercial firm	Norway
ASTRON Netherlands Institute for Radio Astronomy	ASTRON	government	Netherlands
Astronomical Institute AS of the Czech Republic	AsU Ondrejov	other	Czech Republic
Astrophysikalisches Institut Potsdam	AIP	government	Germany
Augsburg College		university	United States
Belgian Institute for Space Aeronomy	BIRA-IASB	government	Belgium
British Antarctic Survey	BAS	government	United Kingdom
British Geological Survey	BGS	government	United Kingdom
Center for Space Radiations	CSR	university	Belgium
Central Institute for Meteorology and Geodynamics	ZAMG	government	Austria
Centre d'Etude Spatiale des Rayonnements	CESR	university	France
Centre for Plasma Astrophysics, K.U.Leuven	CPA	university	Belgium

Context help

On this page, organizations in the database can be listed.

First, select between legal entities and subsidiary organizations.

Next, a selection can be made on organization type or country, and the query results can be sorted by name, type (for legal entities) or country.

Clicking on the organization name in the results table will open a new window with more detailed information.

Read more >>>

Contact and feedback

If you have questions, comments or other feedback, please send a message to [info@ssa-sn1.eu](mailto:info@ssa-sn1.eu).

Service domain	Number of requested services
Spacecraft design	3
Spacecraft operation	4
Human Space flight	3
Launch operation	6
Transionospheric radio link	5
Space surveillance and tracking	4
General data services	6
Non-space system operations	5
Global Space Weather modelling	1

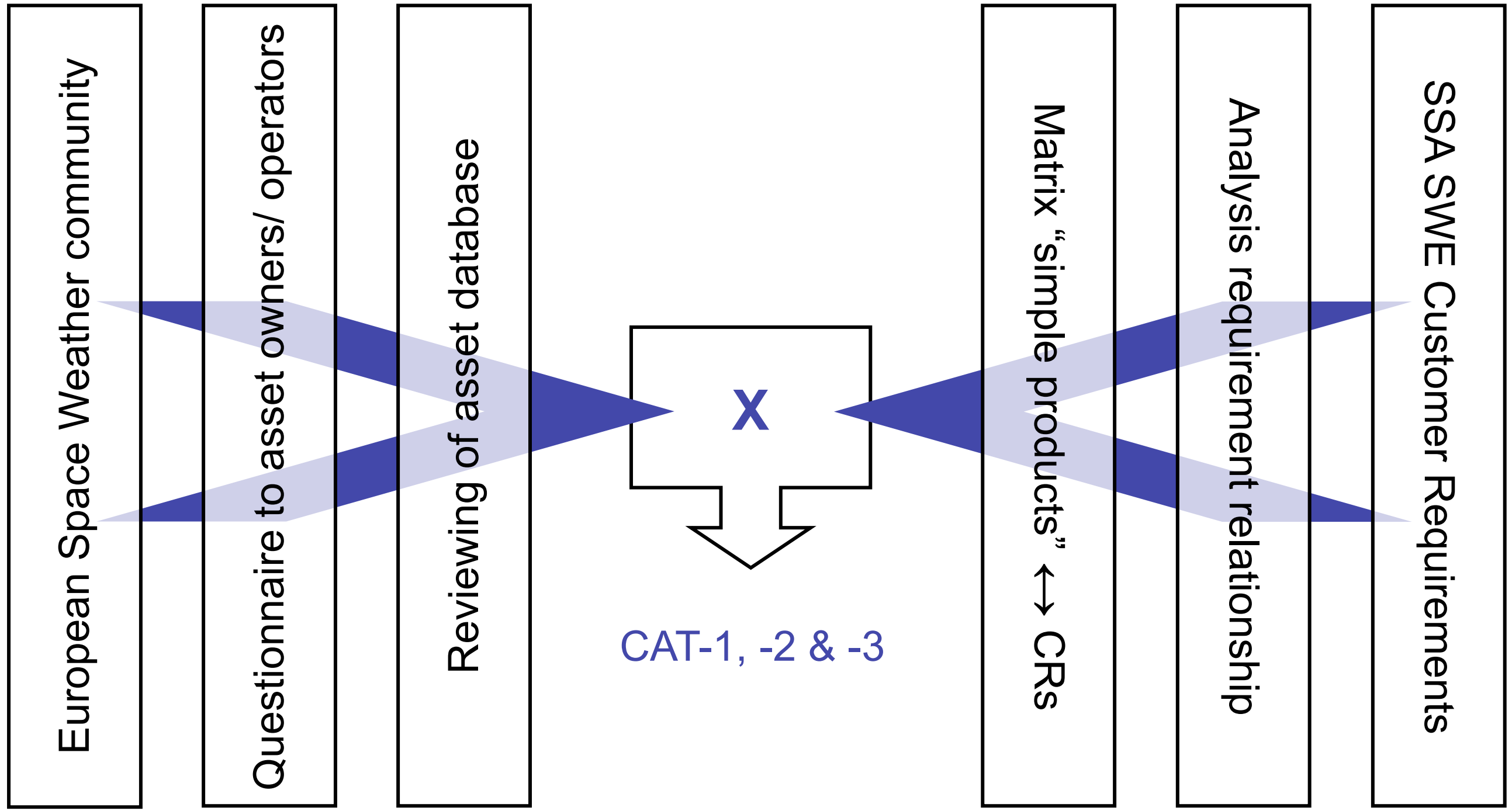
Total: 37

## Objective 2:

### Blueprint 37 Space Weather services.

Main inputs:  
List of services (Annex 1)  
& [AD-SWE-CRD]

# Two-side approach

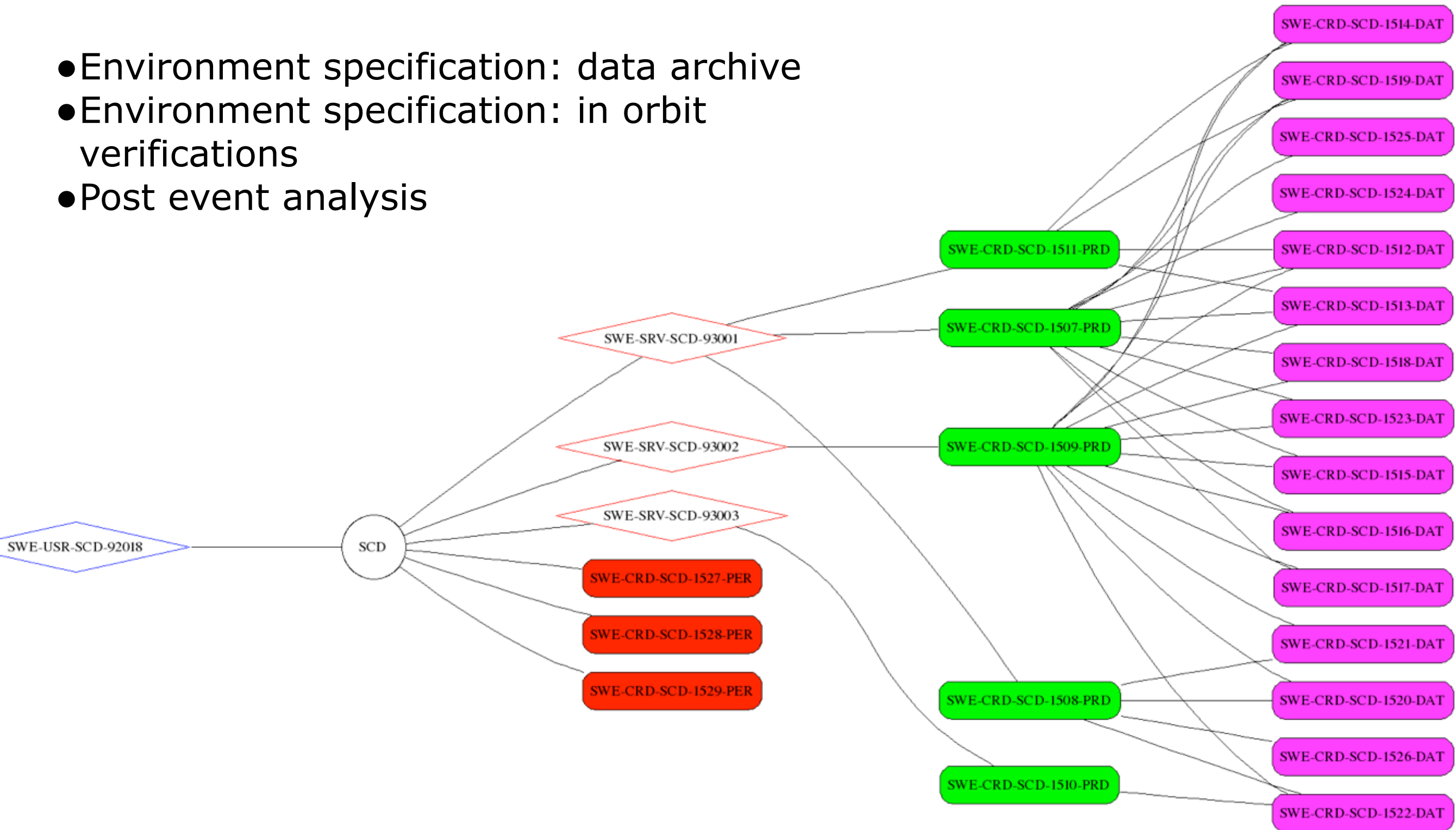




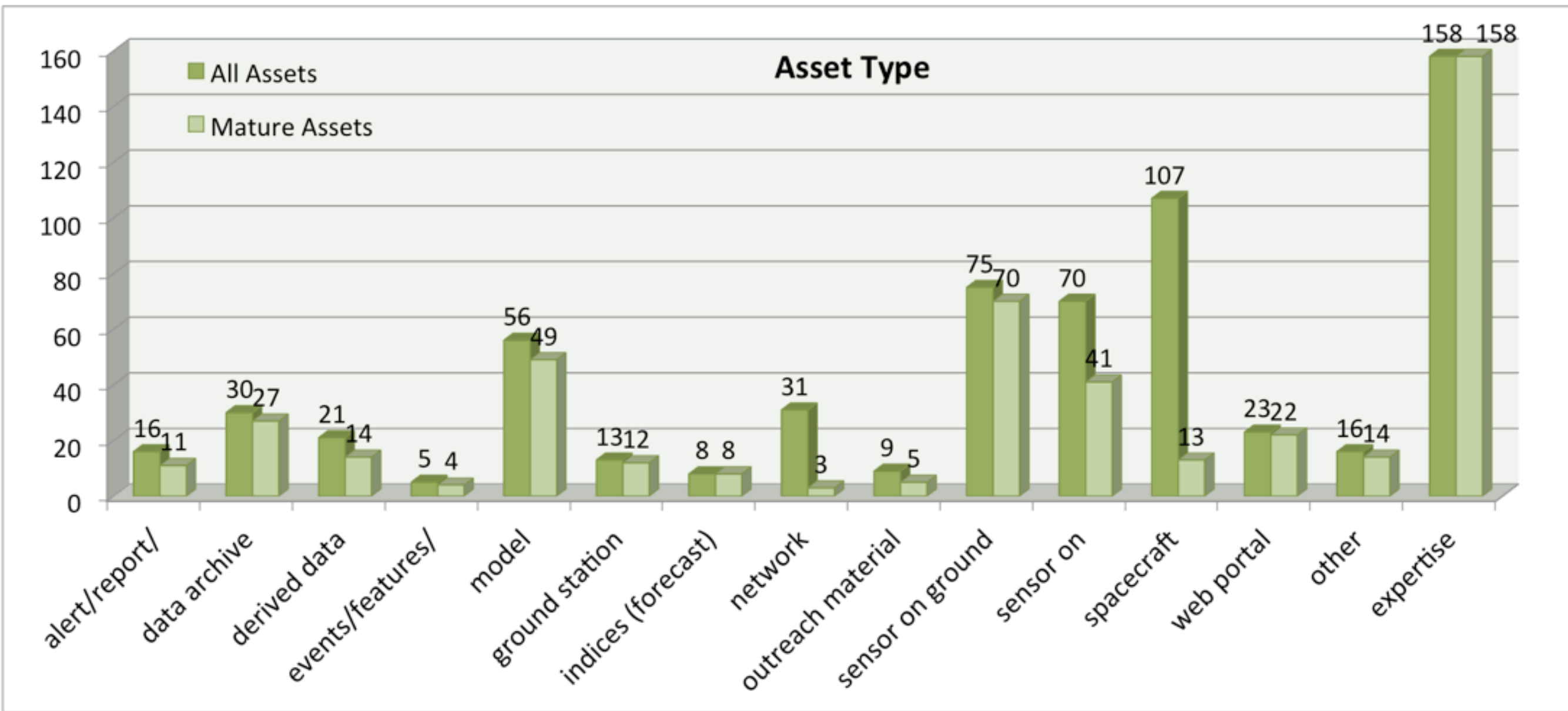
# CRD analysis requirement relationship

Services:

- Environment specification: data archive
- Environment specification: in orbit verifications
- Post event analysis



# Some asset statistics



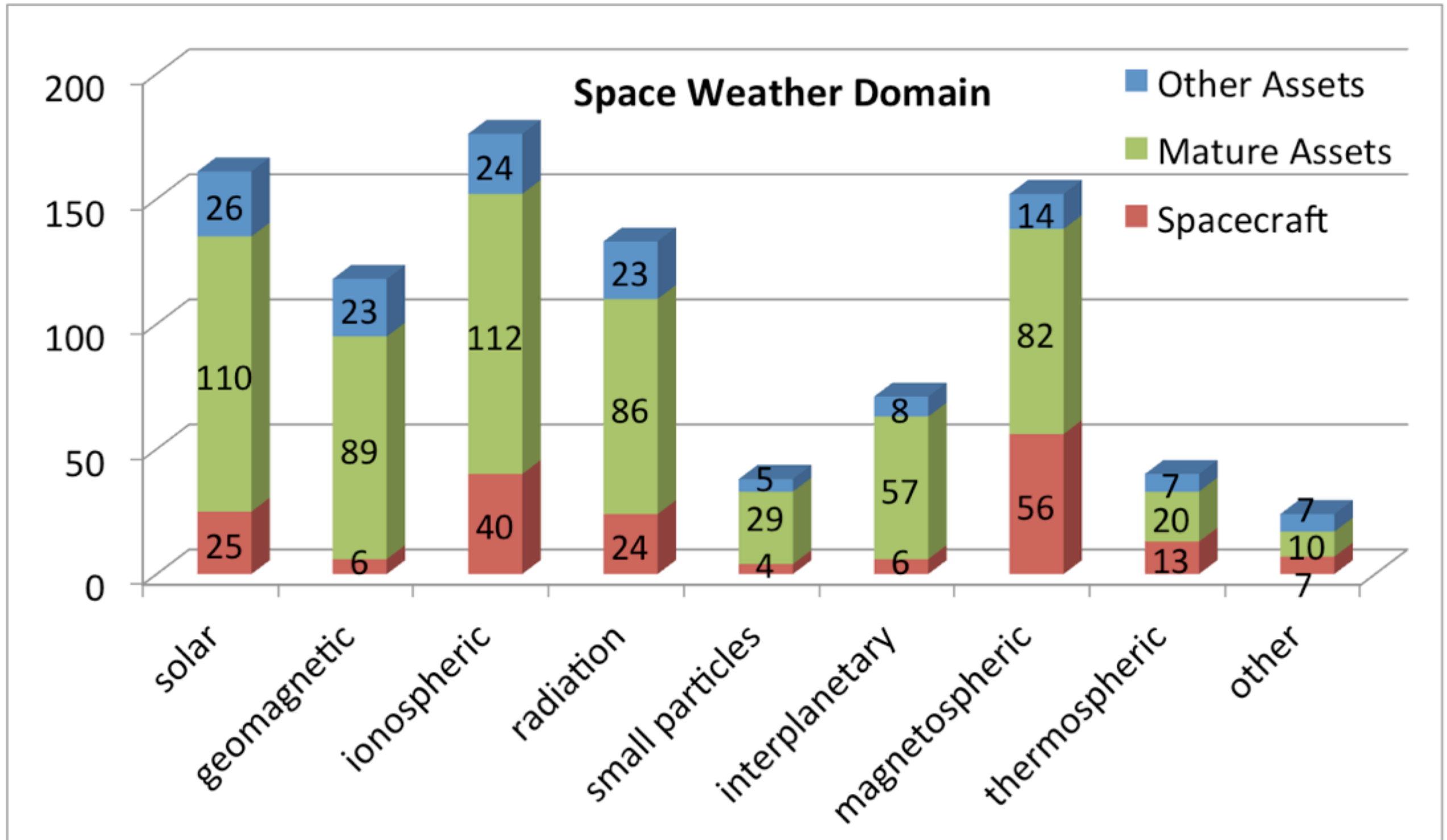
**Figure 2: Asset type distribution for mature assets, as compared to the distribution for all assets.**

Total # assets: 480

Total experts: 158

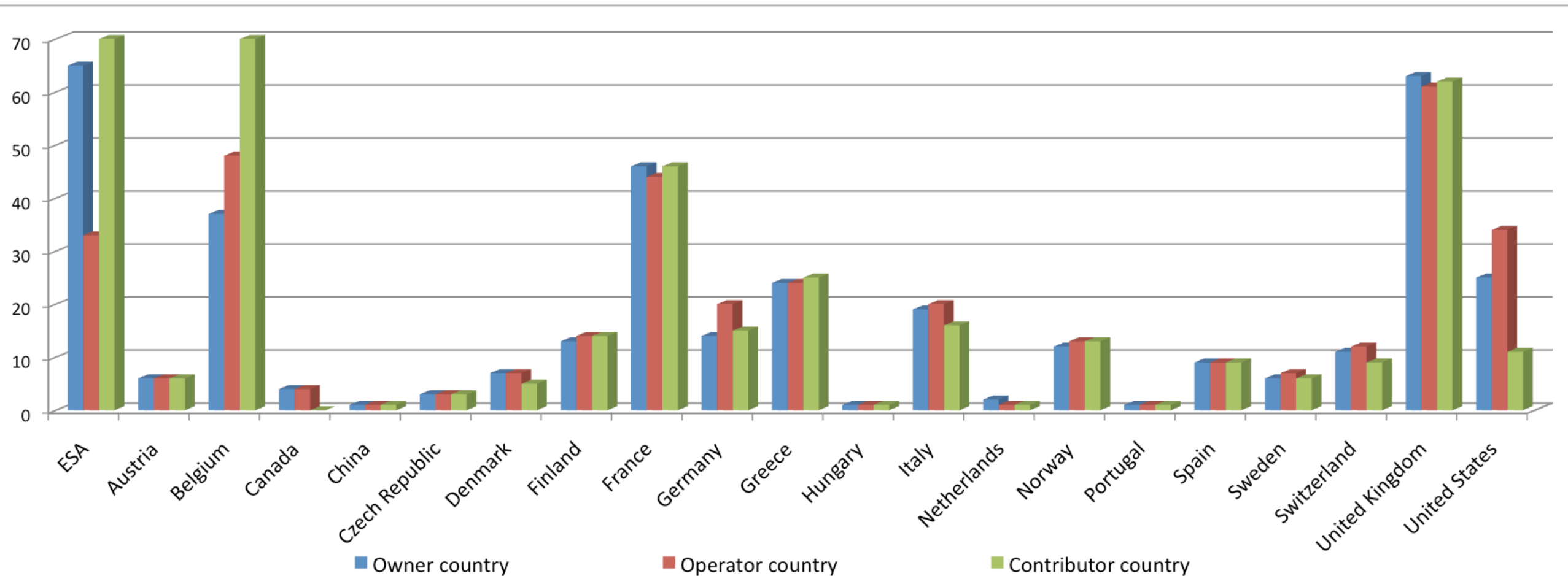


# Some asset statistics



**Figure 3: Asset distribution per Space Weather Domain.**

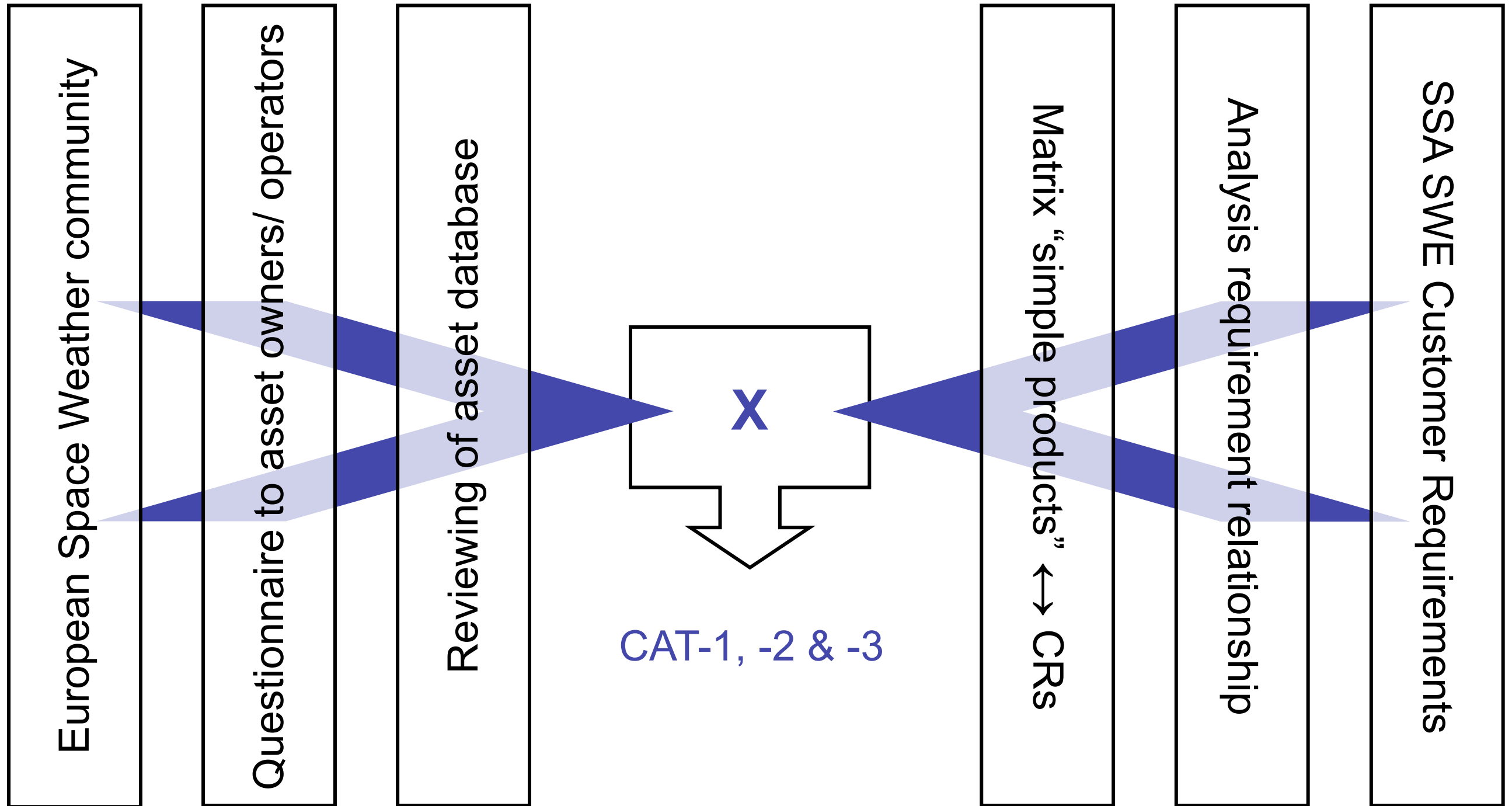
# Some asset statistics



Asset Distribution per country (\*)

(\*) Not all countries are SSA countries.

# Two-side approach



# Categorisation of services

- Cat-1 Service: At least one application is already running in an operational environment (i.e. providing a service to an end user) and a combination of this and other available assets can fulfill a substantial set of the applicable customer requirements.
- Cat-2 Service: The service building blocks exist, with a substantial set of existing assets currently unavailable or in hibernation. A limited set of applicable customer requirements can be fulfilled by a combination of those assets currently available.
- Cat-3 Service: One or more of the required building blocks is missing, with the effect that a combination of existing assets will provide at most a partial service, addressing a limited number of the applicable customer requirements.

SCD Environment specification: data archive	SCD Environment specification: in orbit verification	SCD Post event analysis	SCO In-orbit environment and effects monitoring
SCO Post-event analysis	SCO In-orbit environment and effects forecast	SCO Mission risk analysis	SCH In flight crew radiation exposure
SCH Cumulative crew radiation exposure	SCH Increased crew radiation exposure risk	LAU In-flight monitoring of radiation effects in sensitive electronics	LAU Estimate of radiation effects in sensitive electronics
LAU Forecast of radiation storms	LAU Atmospheric density forecast	LAU Risk estimate of service disruption caused by ionospheric scintillations	LAU Risk estimate of micro-particle impacts
TIO near real-time TEC maps	TIO Forecast TEC maps	TIO Quality assessment of ionospheric correction	TIO near real-time ionospheric scintillation maps
TIO Monitoring and forecast of ionospheric disturbances	SST Atmospheric estimates for drag calculations	SST Archive of geomagnetic and solar indices for drag calculation	SST Forecast of geomagnetic and solar indices for drag calculation
SST Nowcast of ionospheric group delay	NSO Service to power systems operators	NSO Service to pipeline operators	NSO Service to airlines
NSO Service to resource exploitation system operators	NSO Service to auroral tourism sector	GEN Space weather data archive	GEN Latest data guaranteed service
GEN Space weather nowcast and forecast products (daily, weekly)	GEN Event based alarms	GEN Space Weather Support Material	GEN Virtual space weather modelling system
GEN Guaranteed data service for third-party/added-value service providers			



# Where do we go from here?

- Initial operations of precursor services: fall 2011
- Assessment of the services & user feedback
- Set-up of services / mock-ups / virtual services for testing
- test campaigns
- Talk to me if you are interested to be test user! or send me an email [Eva.Robbrecht@oma.be](mailto:Eva.Robbrecht@oma.be).

