

Integrated non-CO₂ Greenhouse gas Observing System

InGOS

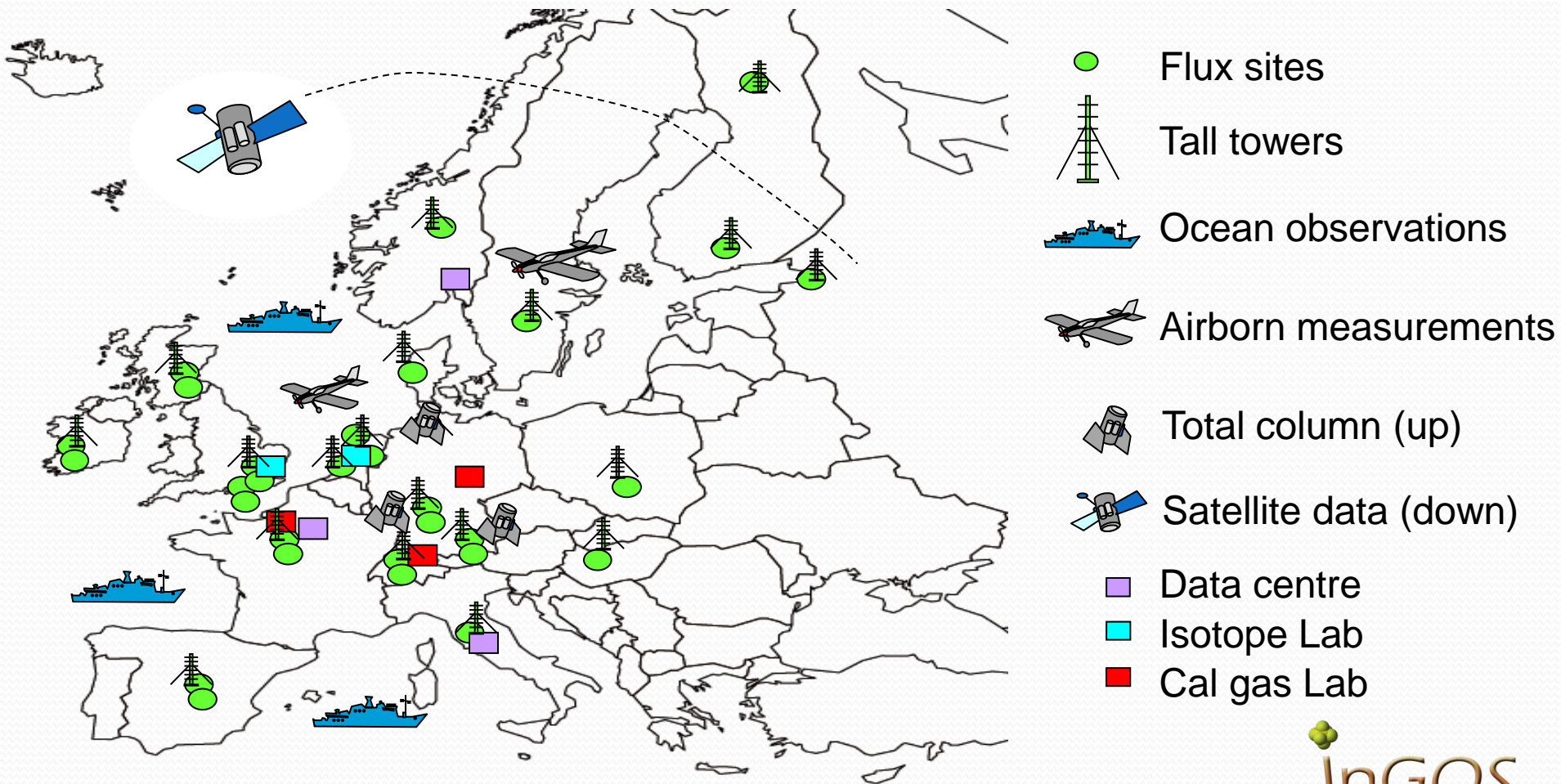
Integrated non-CO₂ Greenhouse gas Observing
System

InGOS target

- Infrastructure project I3
 - 10 mE

improving and extending
the European observation capacity
for non-CO₂ greenhouse gases

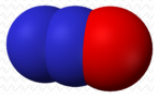
InGOS existing infrastructure



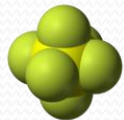
The InGOS gases



Methane (CH₄)



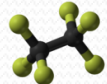
Nitrous Oxide (N₂O)



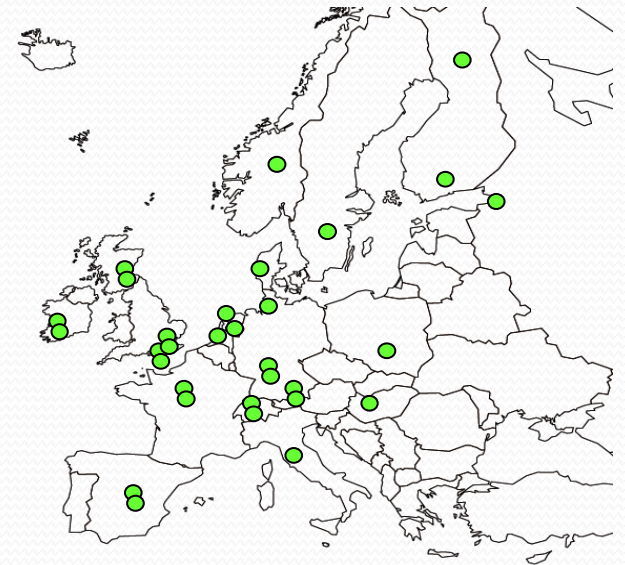
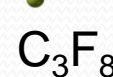
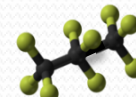
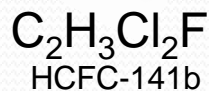
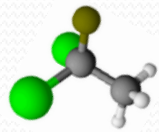
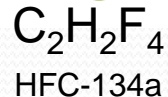
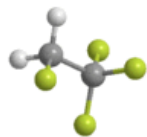
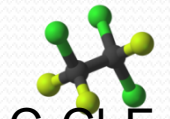
Sulphur Hexafluoride (SF₆)



Waterstof (H₂)



Halocarbons (many different species)

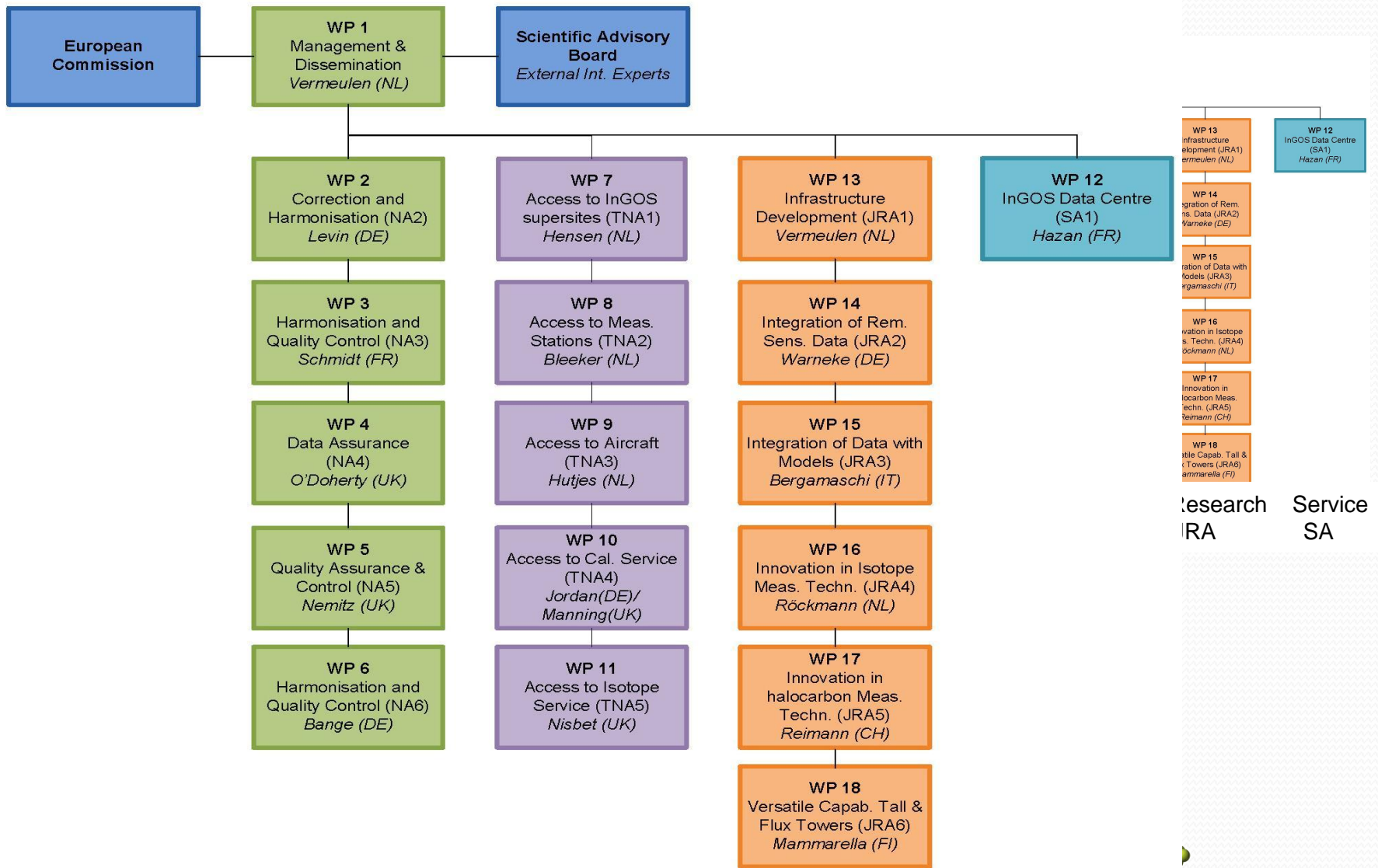


Radon (²²²Rn)



InGOS

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Network Activities

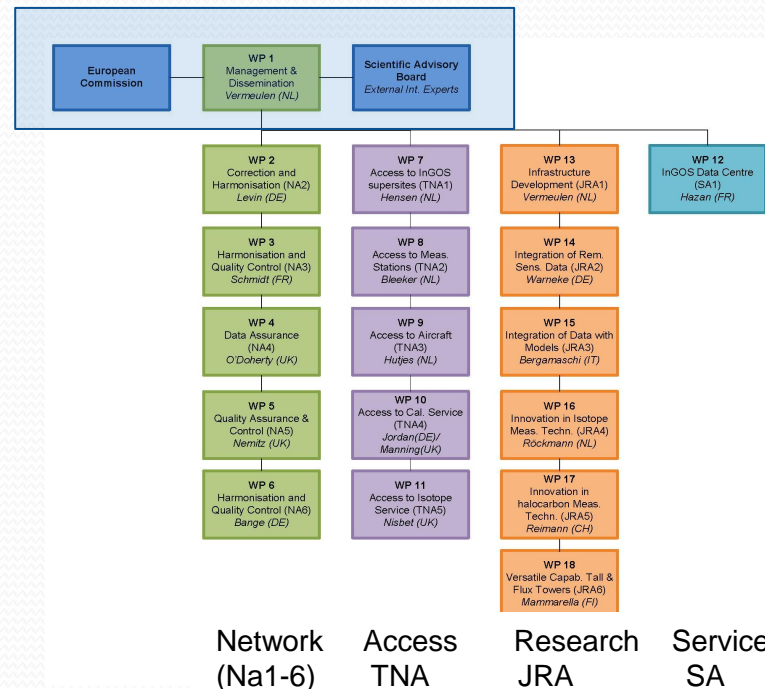
Transnational Access Activities

Joint Research Activities

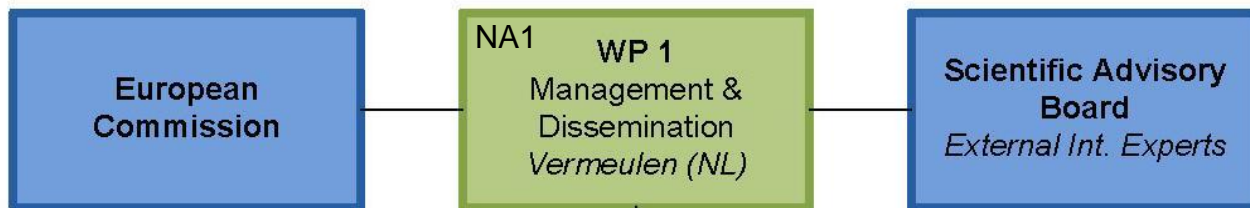
Service Activities

Research Service
JRA SA

InGOS Structure



NA1: Running the project & reporting to EU



InGOS Structure

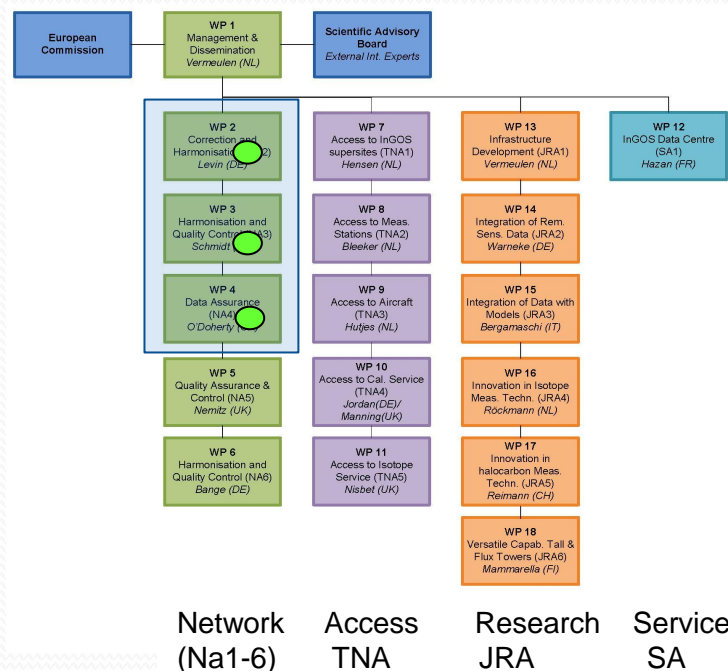
NA 2,3,4: Harmonisation



NA2 WP 2
Correction and Harmonisation (NA2)
Levin (DE)

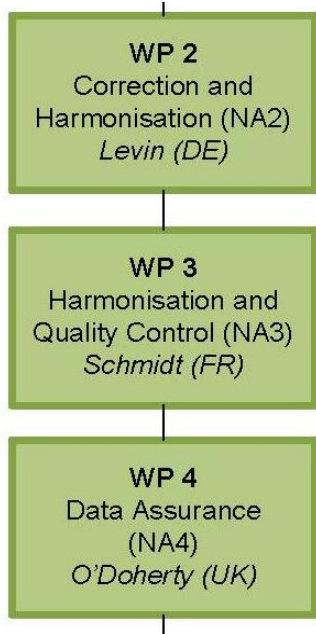
NA3 WP 3
Harmonisation and Quality Control (NA3)
Schmidt (FR)

NA4 WP 4
Data Assurance (NA4)
O'Doherty (UK)

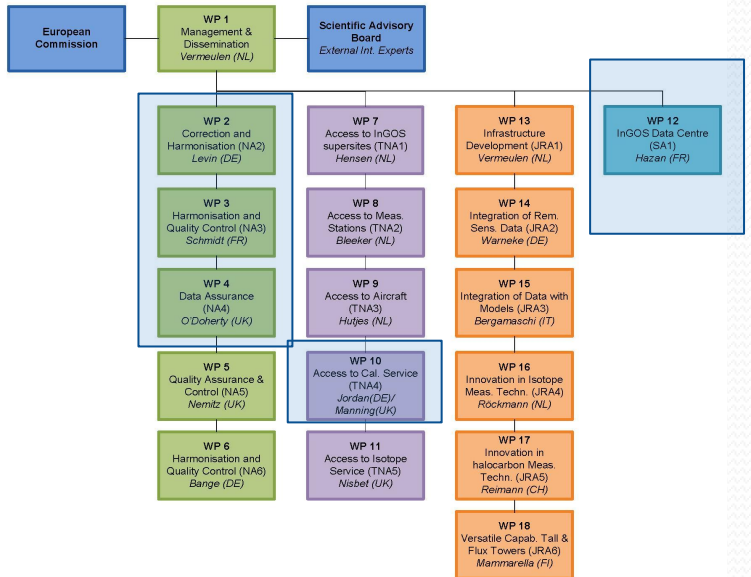
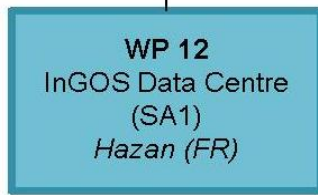
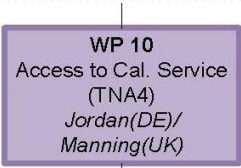


InGOS Structure

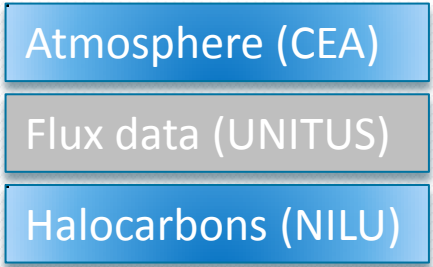
NA 2,3,4



Calibrations

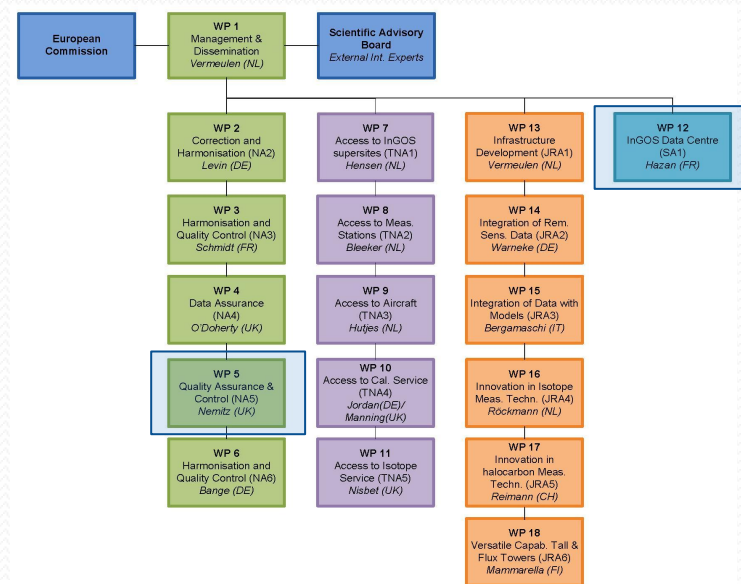
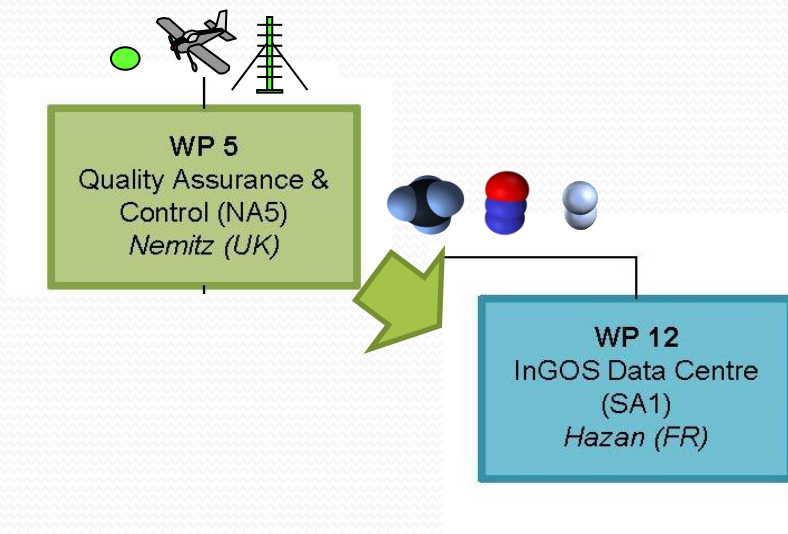


Network (Na1-6) Access TNA Research JRA Service SA

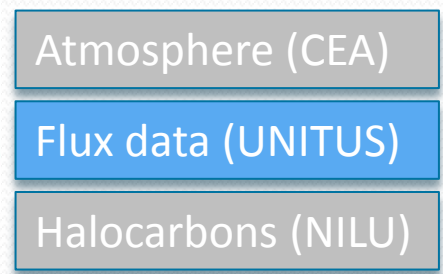


InGOS Structure

NA 5: Harmonisation for Flux data

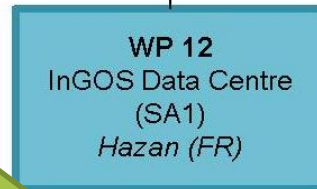
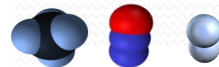
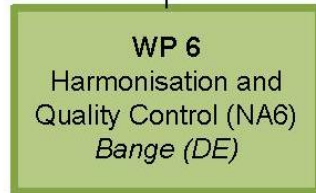


Network (Na1-6) Access TNA Research JRA Service SA

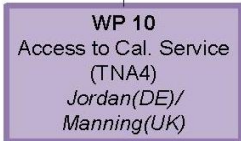


InGOS Structure

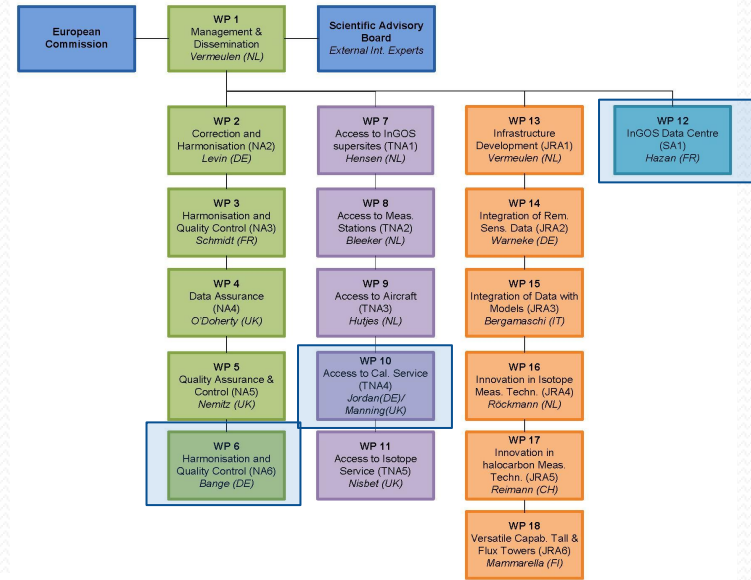
NA 6: Ocean data



Calibrations



MEMENTO (IFU)



Network (Na1-6)

Access TNA

Research JRA

Service SA

Atmosphere (CEA)

Flux data (UNITUS)

Halocarbons (NILU)



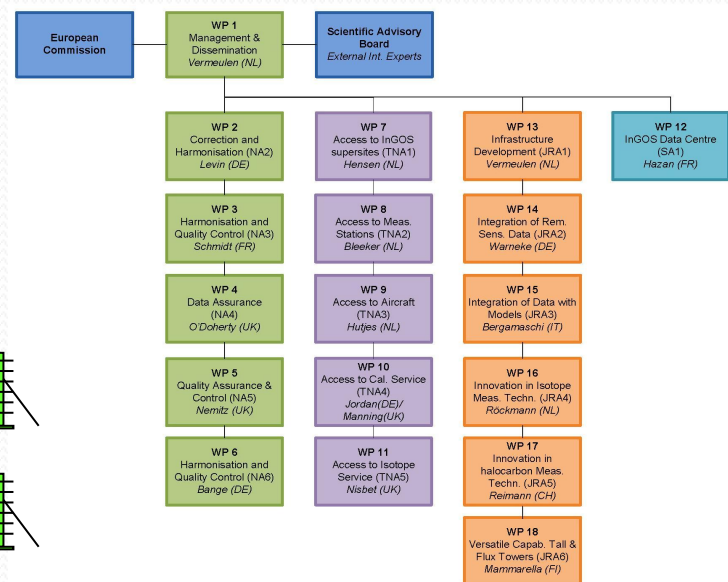
InGOS

Integrated non-CO₂ Greenhouse gas Observing System

Access to stations & facilities



- 6 'super'-sites
 - Stations where JRA campaigns are hosted
- 14 observing stations
- 2 aircrafts for CH₄ flux variability
- Calibration service & Cucumber rotation
- ¹³CH₄ isotope service



Network (Na1-6) Access TNA Research JRA Service SA



Supersites

CABAUW 200m Netherlands



Supersites

CABAUW
200m NL (ECN)



Weybourne
200m UK (UEA)

GGLES
London (RHUL)

SMEAR II Hyytiala
127m Fin (UHEL)

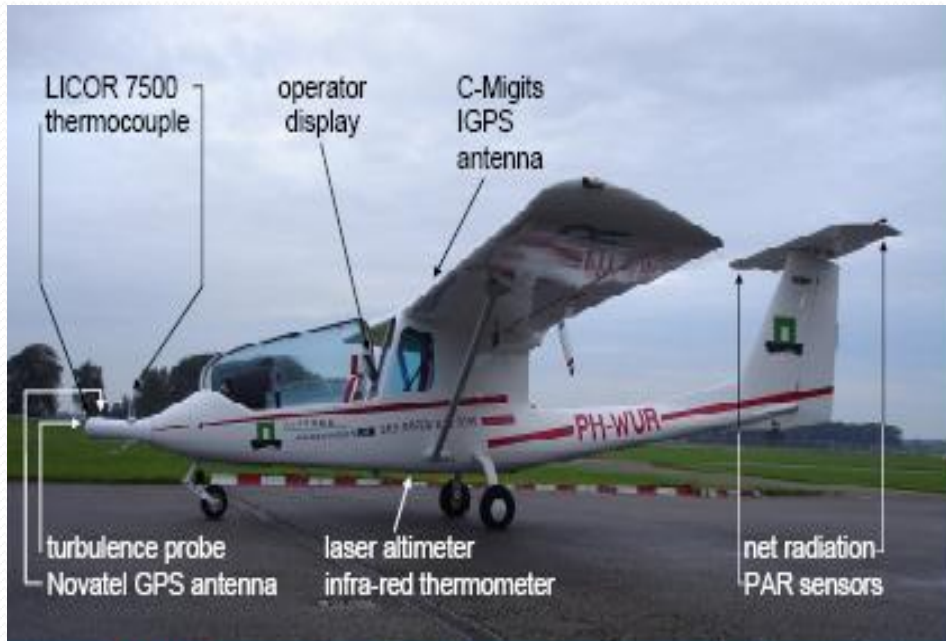
RISOE Willow Field (Dk)
(RISOE)

GGLES London (RHUL)

Observing stations (are super too)



Airplanes



TNA="rent a plane"

Boats & Satellites

NO ACCESS



But feel free to try...



Integrated non-CO₂ Greenhouse gas Observing System

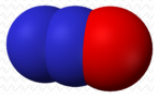
InGOS brief

- Infrastructure project I3
- Combination of Coordination, Support & RTD activities
- EU FP7
- Budget 10 M€
- EU contrib 8 M€
- Builds on projects like: CarboEurope, CHIOTTO, Geomon, IMECC, EUROHYDROS, SOGE, ICOS-PP etc.
- Coordinator ECN, NL
- 34 partners
- Runtime 4 years
- Start October 2011
- Integration non-CO₂ observations into ICOS
- CH₄, N₂O, SF₆, halocarbons, ²²²Rn
- 23 stations
- Open for network extension

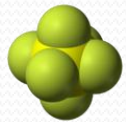
The InGOS gases



Methane (CH₄)



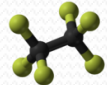
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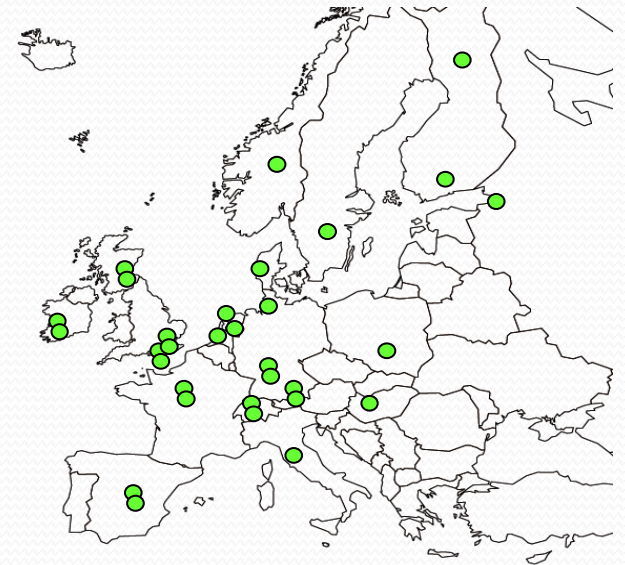
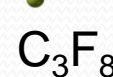
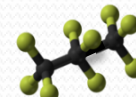
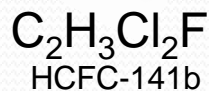
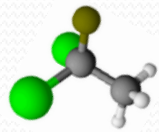
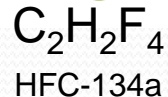
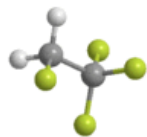
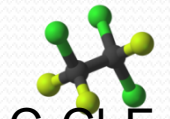
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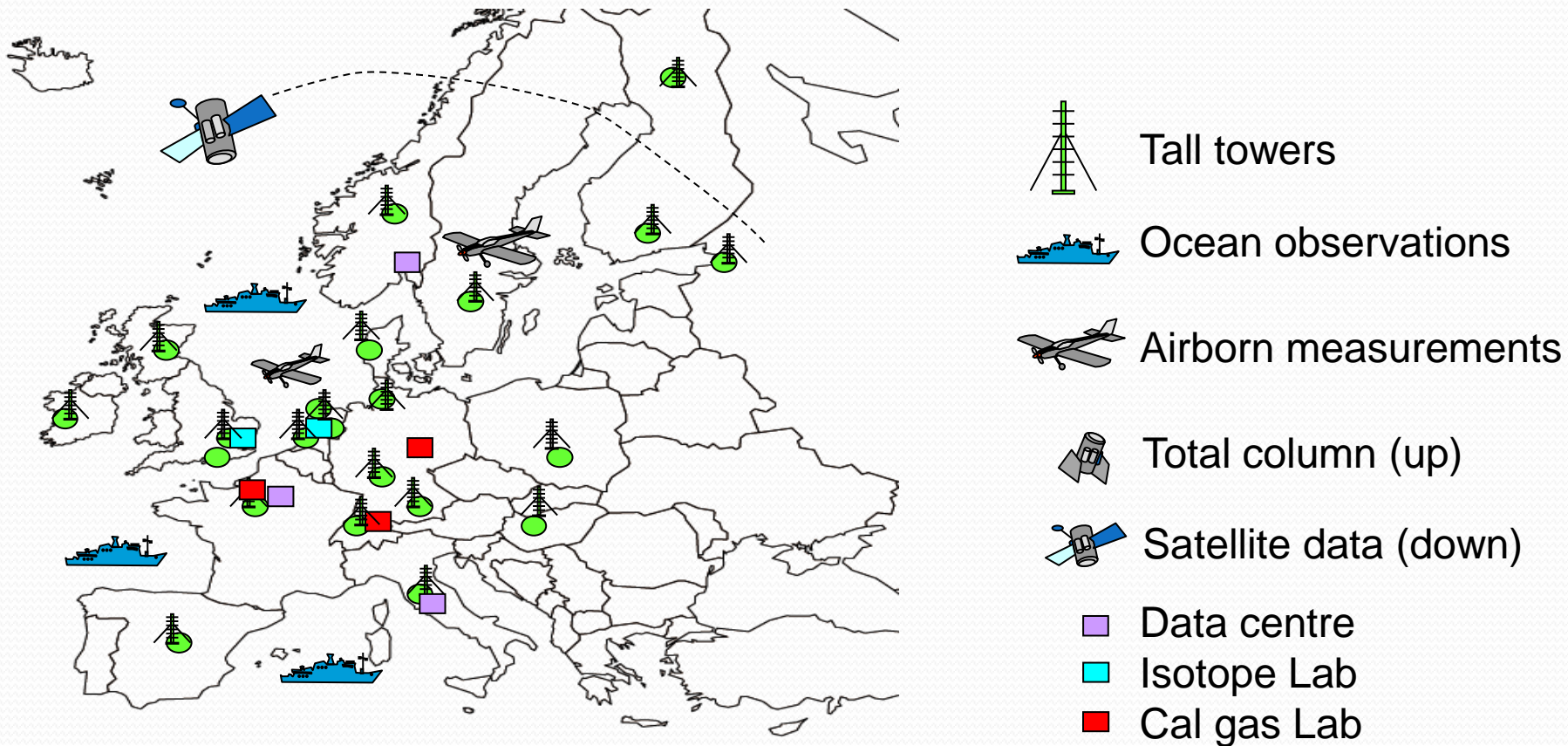
Radon (²²²Rn)



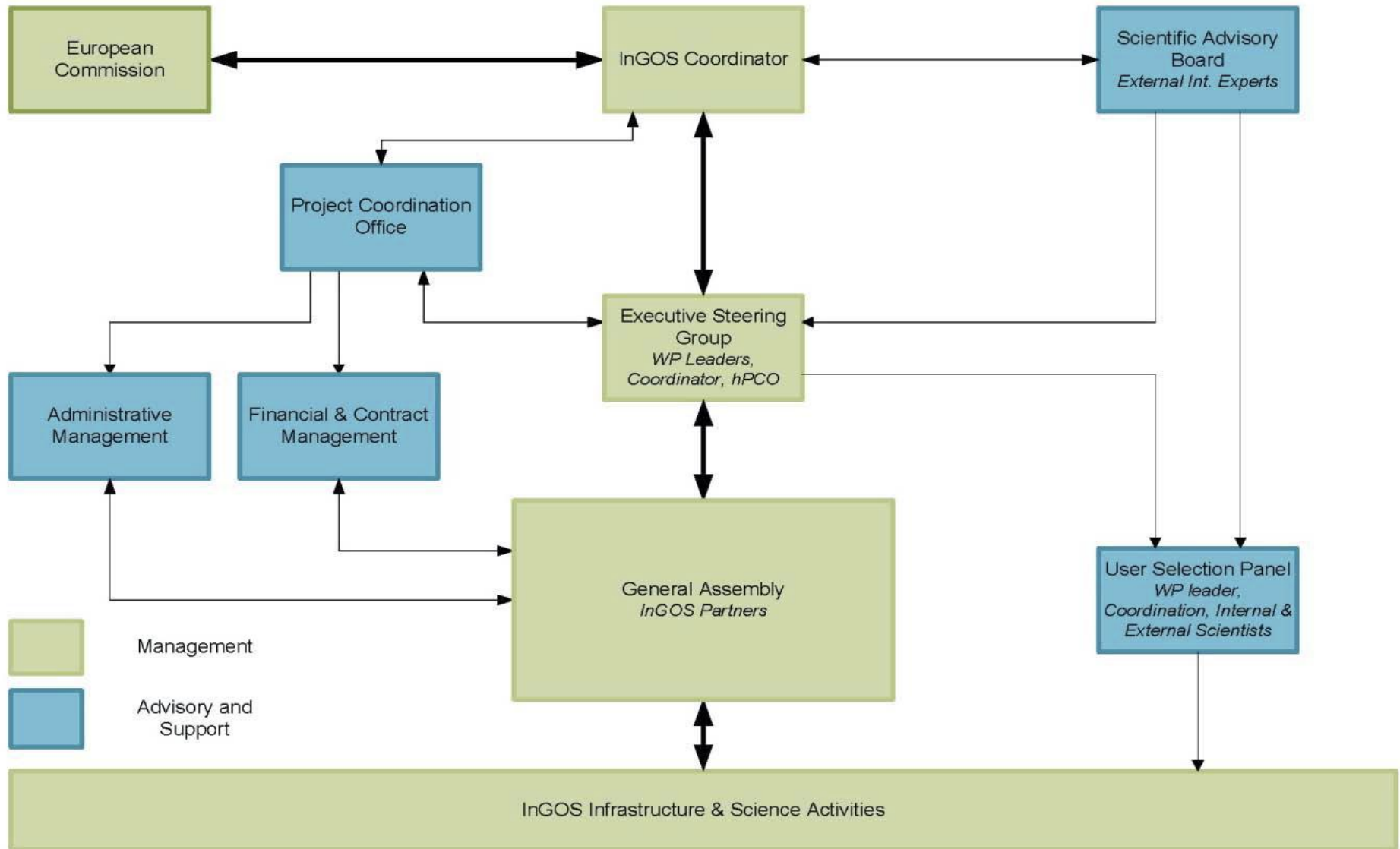
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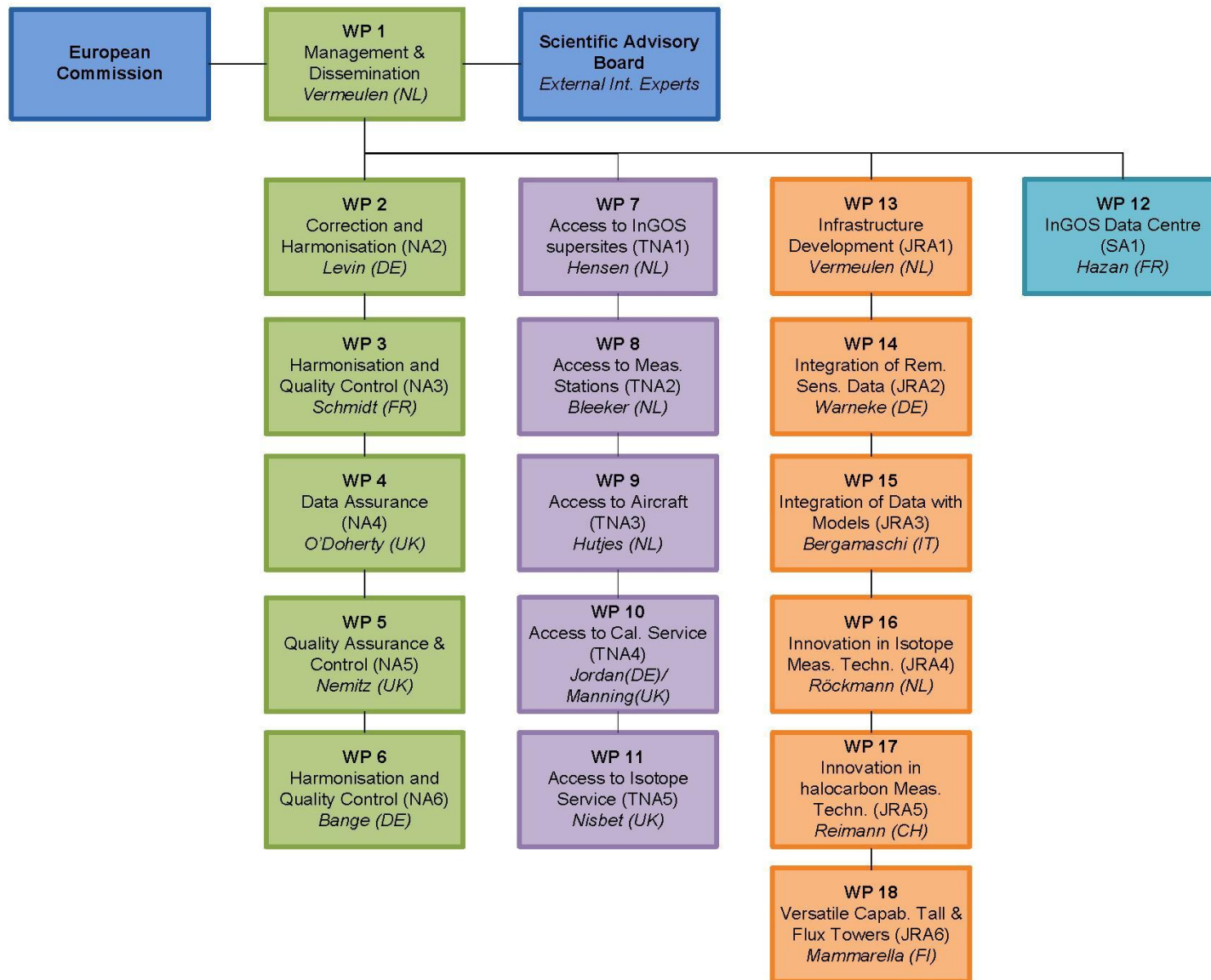
InGOS existing infrastructure



InGOS management structure



Work packages



Network Activities

Transnational Access Activities

Joint Research Activities

Service Activities

Work packages

WP nr	Work Package title	Work Package leader
Project office	NA1: InGOS Management and coordination	Albert Bleeker (ECN)
WP1	NA1: InGOS Management and coordination	Alex Vermeulen (ECN)
WP2	NA2: Correction and harmonisation of historic concentration measurements	Ingeborg Levin (UHEI)
WP3	NA3: Harmonisation and quality control of future measurements of CH ₄ , N ₂ O and H ₂	Martina Schmidt (CEA)
WP4	NA4: Data assurance halocarbon measurements	Simon O'Doherty (UNIVBRIS)
WP5	NA5: Quality assurance and quality control of non-CO ₂ gas flux measurements	Eiko Nemitz (NERC)
WP6	NA6: Ocean measurements of non-CO ₂ gases	Hermann Bange (IFM-GEOMAR)
WP7-9	TNA1,-3: Access to supersites, stations & airplanes	Arjan Hensen (ECN)
WP10	TNA10: Access to calibration service	Armin (MPG)
WP12	SA1: The InGOS data centry	Lynn Hazan (CEA)
WP13	JRA1: Infrastructure development	Alex Vermeulen (ECN)
WP14	JRA2: Integration of remote sensing data into in situ network	Thorsten Warneke (UoB)
WP15	JRA3: Integration of data with models	Peter Bergamaschi (JRC-IES)
WP11	JRA4: Innovation in isotope measurement techniques	Thomas Röckmann (UU)
WP16		
WP17	JRA5: Innovation in halocarbon measurement techniques	Stefan Reimann (EMPA)
WP18	JRA6: Versatile capabilities of combined tall and flux towers	Ivan Mammarella (UHEL)



The InGOS network



Networking objectives



- Integrate European facilities for NCGHG observations
 - Linking the different communities for CH₄, N₂O, H₂, halocarbons, tracers, atmosphere, ecosystem flux, ocean
- Improve the quality of historical, current and future NCGHG obs. (concentrations, fluxes, atmosphere & ocean)
- Prepare expansion of the network in undersampled regions

Access and Services



- Provide access to observation sites and facilities
- Provide NRT data for CH₄, N₂O, SF₆ and H₂ data (building on IMECC/ICOS)
- Provide uniform databases of observational data
 - Halocarbons: NILU/Geomon
 - Fluxes: UNITUS/ICOS ETC
 - Atmosphere: LSCE/ICOS ATC

JRA: research

- Test and further develop new sensors and observation strategies
- Integration of in-situ data with remote sensing -> TCCON-Europe network
- Modelling: analyze the observations and support the network development
 - Improved top-down emission estimates
 - Uncertainty estimates of derived emissions
 - Validation of model results
 - Evaluate $^{13}\text{CH}_4$ obs. strategy

JRA's continued

- Develop continuous isotope observations for methane and maintain reference scale
- Improve the halocarbon measurement techniques
- Combine tall tower concentration obs. with flux tower observations into regional scale flux estimates

Some products (out of 96 deliverables)

- Unified and improved historic dataset of NCGHG's
- Datasets...
- Databases for flux and concentration observations
- Traveling FTIR and Rn system
- Many reports and workshops
- 2 Summer schools
- Top down emission estimates for Europe
- Website:
 - <http://www.ingos-infrastructure.eu>

More info..

- Abridged DoW will be available after negotiation end
- Leaflet on website:

<http://www.ingos-infrastructure.eu>

Coordinator: a.vermeulen@ecn.nl

Dissemination and outreach: hensen@ecn.nl