ECMWF Time-Critical (TC) Applications

Options 2 and 3

Alon Shtivelman

alon.shtivelman@ecmwf.int

ECMWF

Content

- Time-Critical (TC) applications – history

- TC-1: Option 1 – Simple Member States (MS) jobs – was just mentioned in ECaccess presentation

- TC-2: Option 2 – ecflow suites managed by MS and monitored by ECMWF

- TC-3: Option 3 – ecflow suites managed and monitored by ECMWF Review of TC services
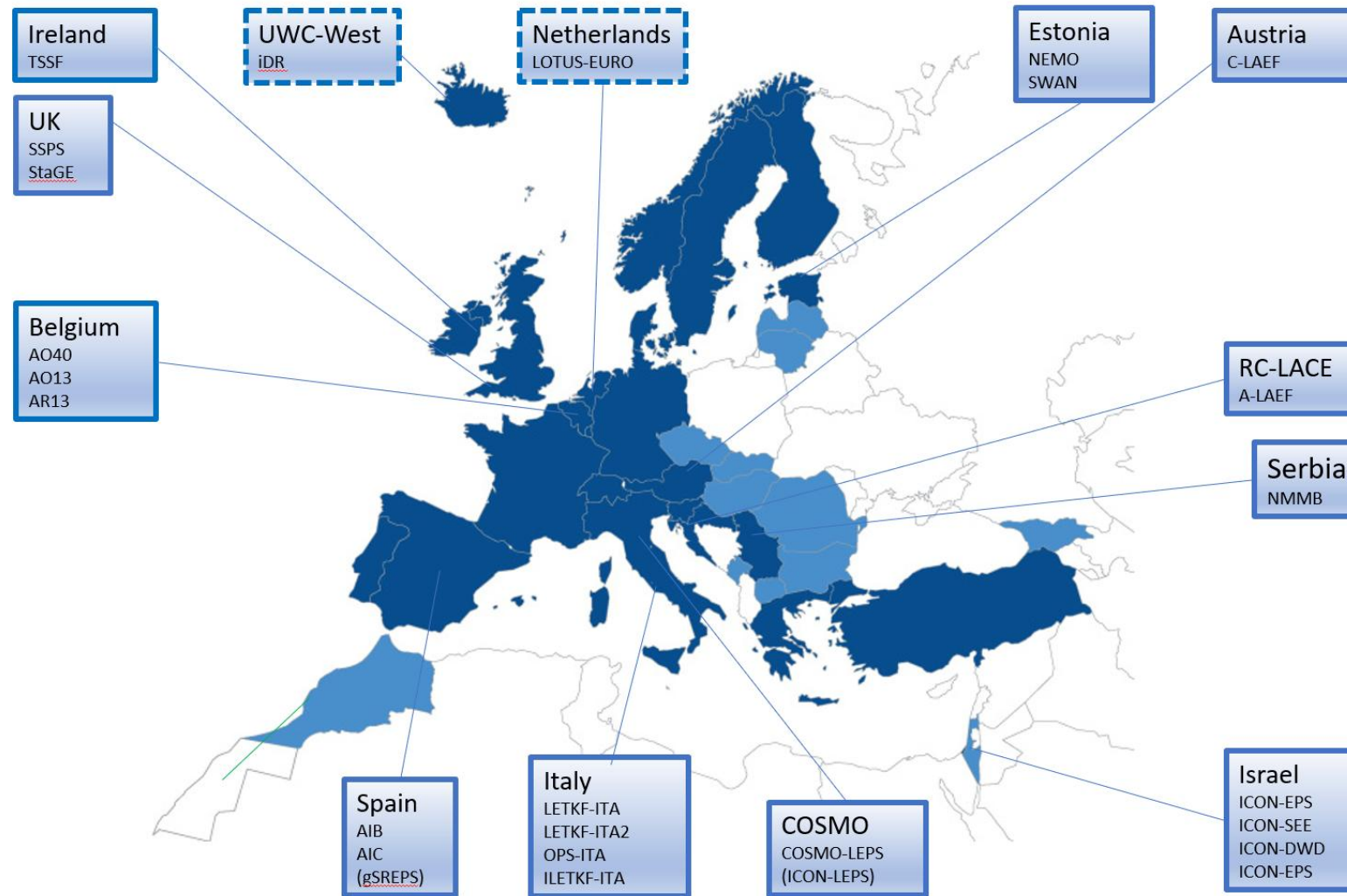
- Review of TC services

History of Time Critical (TC) services

- Before 2004:

  – Since 1991, MS jobs triggered by the ECMWF operational suite: basic TC-1 service

  – Late 1990-ties, increased interest by MS in ENS data: first embryonic TC-2 services

  – Early 2000, several activities run for MS, including NORLAMEPS and HRES hourly data produced for 2004 Olympic games in Athens: first TC-3 service

- 2004:

  – ECMWF makes proposal for **TC framework** to the Technical Advisory Committee, including 3 options

  – Council approves the TC framework

- 2005:

  – 3 TC options being implemented, with guidelines to users

ECMWF EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS

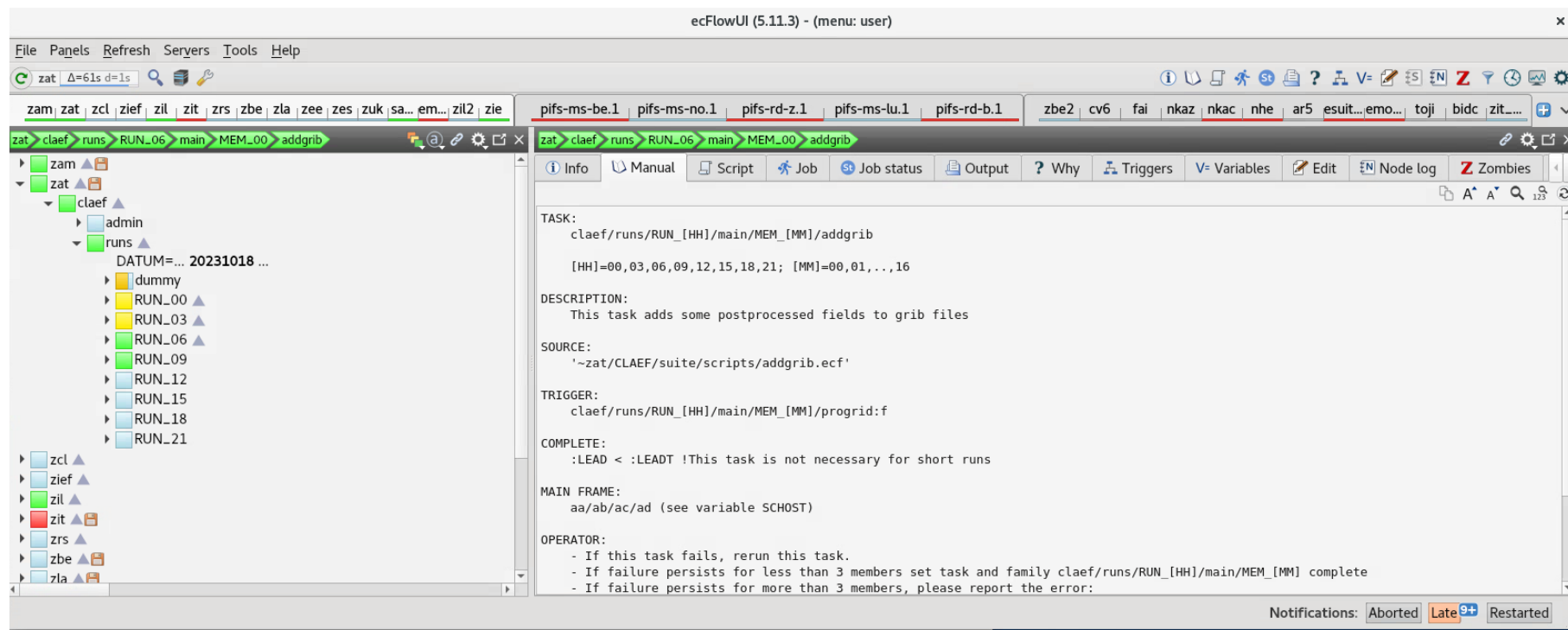# TC option 2: Member State ecFlow suites monitored by ECMWF:

- Suitable for more **complex** applications comprising several tasks with **interdependencies** between them

- The suites will be developed according to the technical **guidelines** described in [this document](#)

  - ecFlow must be used to orchestrate the suite

  - If you are new to ecFlow, we can help and guide

- Has to be **requested** by the TAC representative of the relevant Member State

- **Monitored** by ECMWF operators, after it is approved

- Part of the member state **SBU allocation** is used to run TC activities

TC option 2: Current activities

Ireland
TSSF

UWC-West
iDR

Netherlands
LOTUS-EURO

Estonia
NEMO
SWAN

Austria
C-LAEF

UK
SSPS
StaGE

Belgium
AO40
AO13
AR13

RC-LACE
A-LAEF

Serbia
NMMB

Spain
AIB
AIC
(gSREPS)

Italy
LETKF-ITA
LETKF-ITA2
OPS-ITA
ILETKF-ITA

COSMO
COSMO-LEPS
(ICON-LEPS)

Israel
ICON-EPS
ICON-SEE
ICON-DWD
ICON-EPS

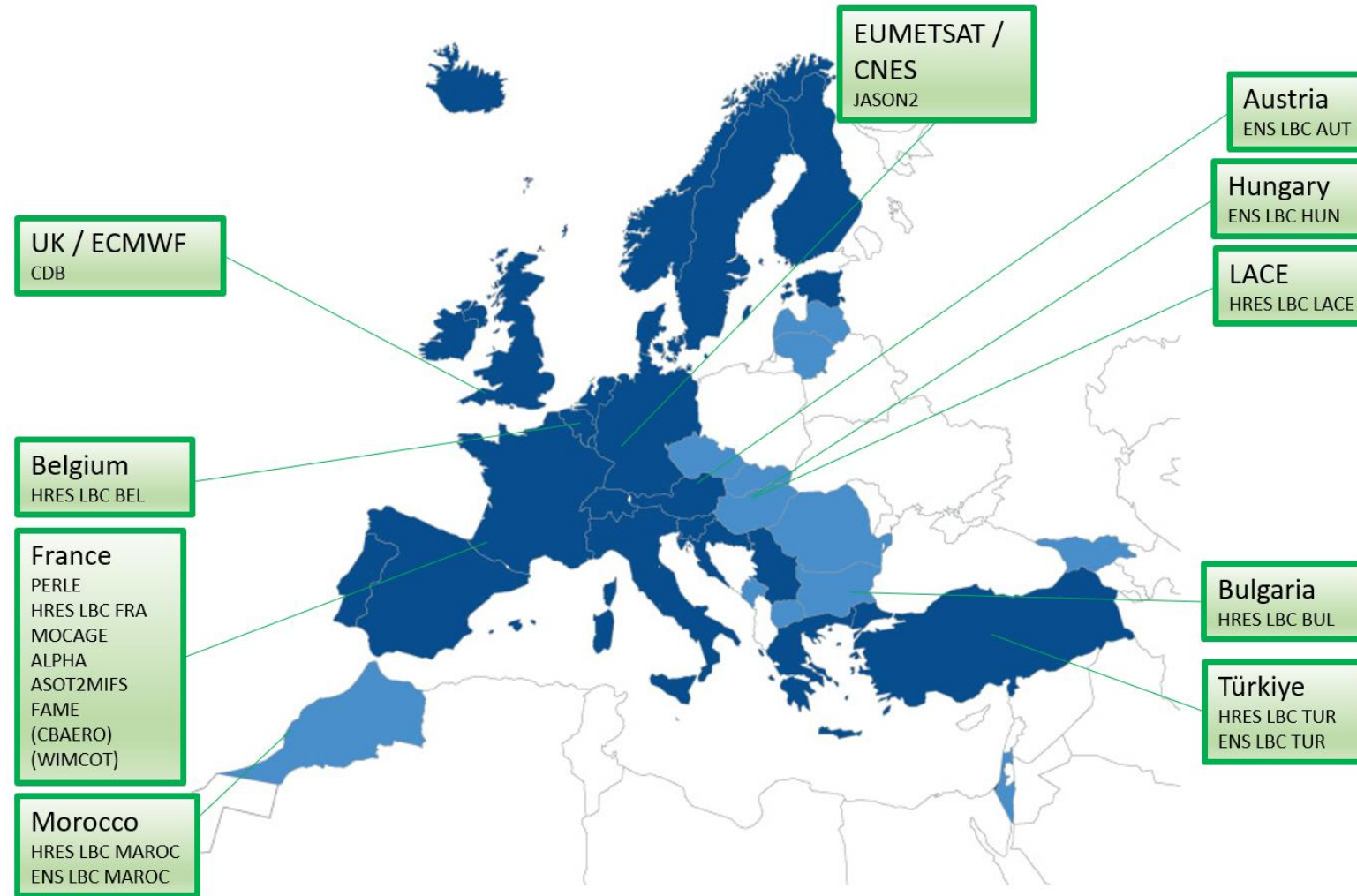# TC option 2: Privileged User Environment

- Special TC-2 **user IDs** used

- Access to all 4 Atos HPC complexes

- Access to **high priority queues**

- Access to multiple HPC local **LUSTRE** file systems

- ecFlow suites, **monitored** by our operators, who will follow instructions in man pages to resolve any issue

- Access to the ECMWF **Production Data Store** for data transmission (Input and Output)
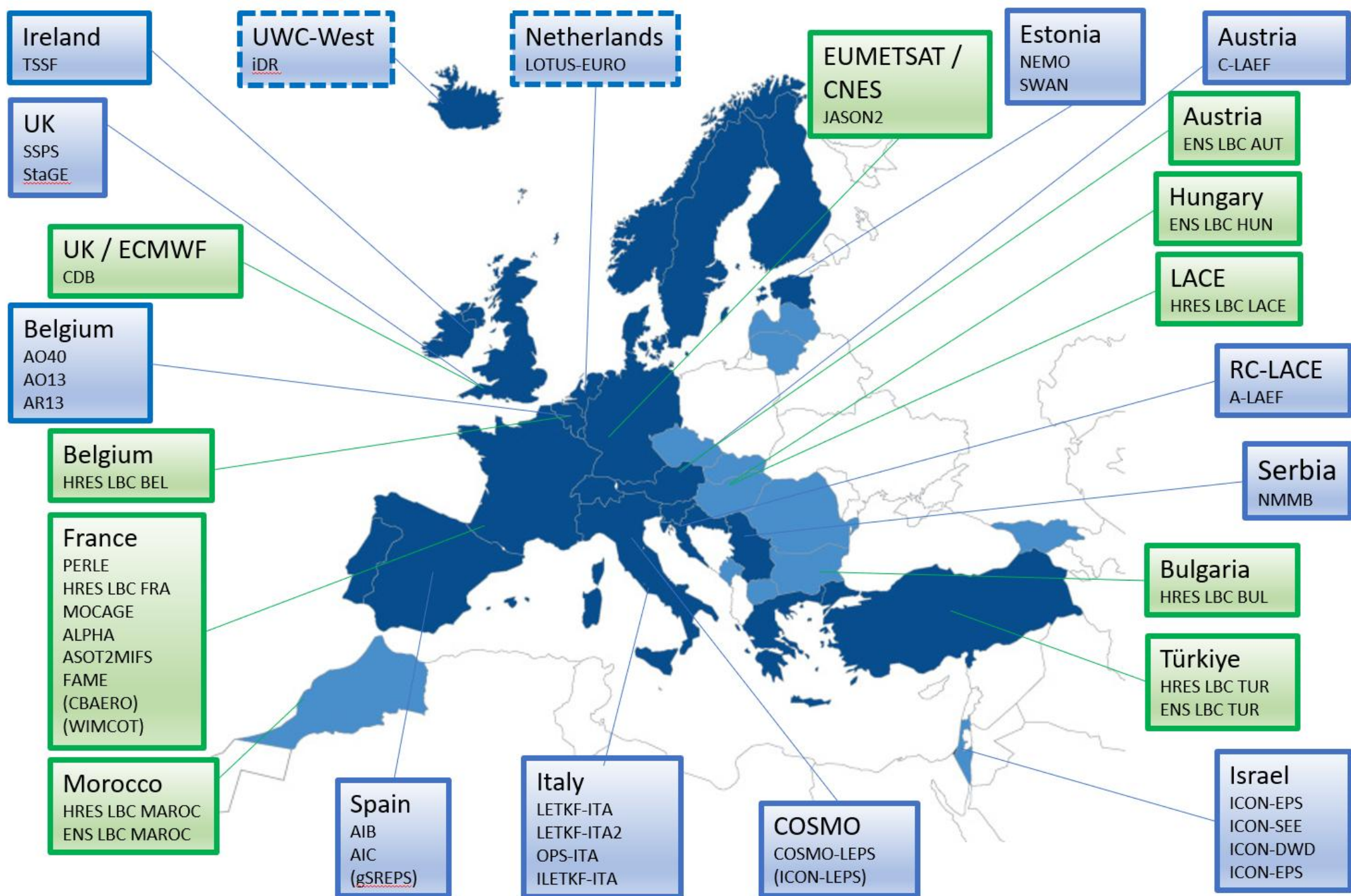
TC option 3: Member State ecFlow suites **managed by ECMWF**

- Further **enhancement** of Option 2

- Requires an ecFlow suite, which has usually been developed under Option 2 of this TC Framework

- Application developed, tested and maintained by the Member State

- It must be possible to **test** the application using ECMWF pre-operational (esuite) data

- Member State suite **handed over** to ECMWF

- Member State responsible for the migration of the application, e.g. when supercomputer changes

- Monitored by ECMWF operators

- ECMWF will provide first-level on-call support, while second-level support would be provided by the Member State

- To be requested by the TAC representative of the relevant Member State

TC option 3: Current activities

EUMETSAT / CNES
JASON2

Austria
ENS LBC AUT

Hungary
ENS LBC HUN

LACE
HRES LBC LACE

UK / ECMWF
CDB

Belgium
HRES LBC BEL

France
PERLE
HRES LBC FRA
MOCAGE
ALPHA
ASOT2MIFS
FAME
(CBAERO)
(WIMCOT)

Bulgaria
HRES LBC BUL

Türkiye
HRES LBC TUR
ENS LBC TUR

Morocco
HRES LBC MAROC
ENS LBC MAROC
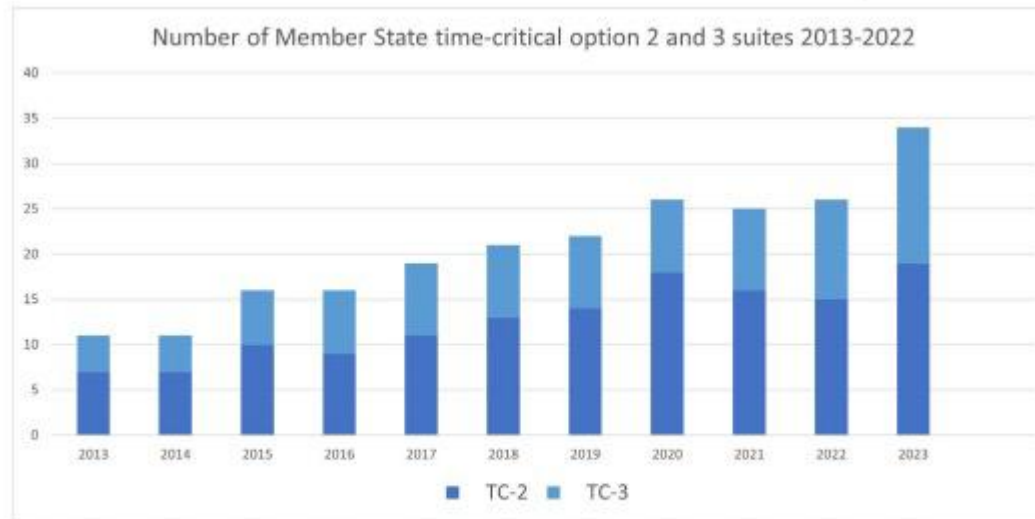
TC activities review

Figure 3: Numbers of time-critical option 2 (TC-2) and option 3 (TC-3) suites being run at ECMWF by the end of each year from 2013 to 2023
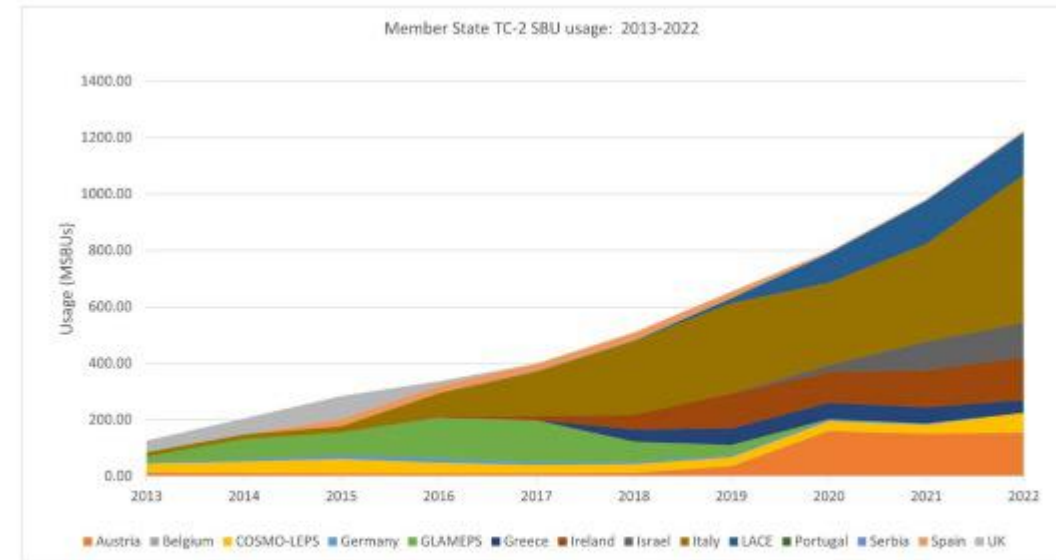

Figure 4: SBU usage by Member State time-critical option 2 activity from 2013 to 2022.

TC activities review

- More systematic usage of **git** to store ecflow files, scripts, source code

- Upgrade process of TC suites to be **clarified**

- European Weather Cloud can be used for TC activities

- TC activities could happen as **containerised** workload on the Atos HPC

- Harmonise all TC suite for easier monitoring and support by the shift staff

- Improved documentation (ecFlow man pages) for more efficient support by ECMWF shift staff, ECMWF second level support staff, possibly also by MS shift staff

- Workshop with MS TC users to advertise changes and share experience

https://confluence.ecmwf.int/display/UDOC/Time+Critical+applications

Thanks!