



Italian National Agency for New Technologies,
Energy and Sustainable Economic Development

Presentation of the CRESCO annual report: Research activities and results 2018 Accounting 2019 (reduced version)

Portici, February 2020

Giuseppe Santomauro – DTE-ICT-HPC – Portici



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0101 0010 1101
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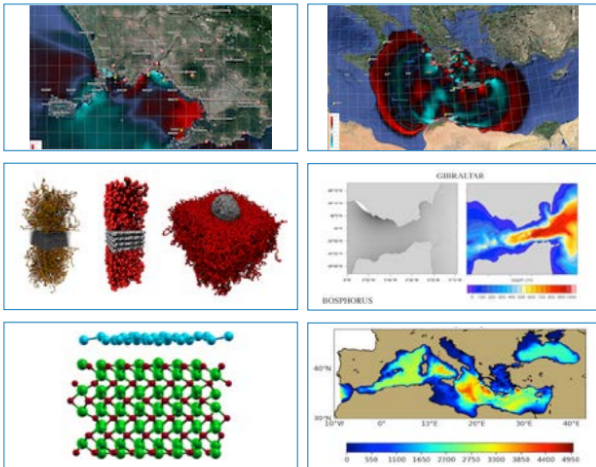
The 2018 Report

Accounting 2019

Cresco report 2018 overview



High Performance Computing on CRESCO infrastructure: research activities and results 2018



December 2019

Number of papers: 44

Total number of authors: 152

Number of pages: 240

Document format: PDF

PDF size (print version): 34 MB

PDF size (web version): 7 MB

<https://www.enea.it/it/seguici/pubblicazioni/edizioni-enea/2019/cresco-results-2018>

Contributions provided by a selection of users of the CRESCO infrastructure

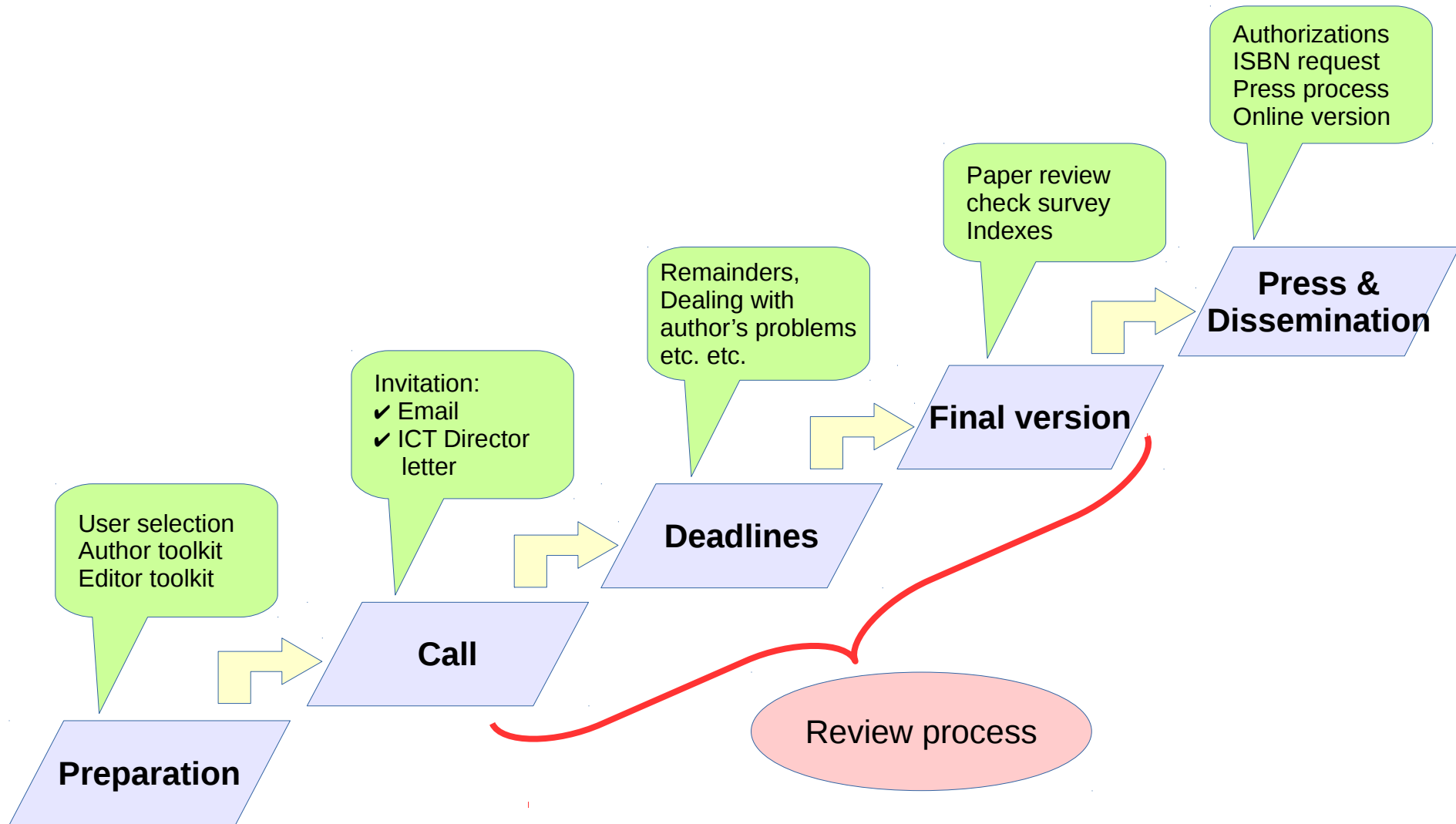
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ENEA, DTE-ICT-HPC, Portici

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Cover: Amedeo Trolese, ENEA, DTE-ICT-PRA, CR Frascati
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See also: [/afs/enea.it/project/eneagrid/html/SystemAdministration/CRESCO_Reports](https://afs.enea.it/project/eneagrid/html/SystemAdministration/CRESCO_Reports)

Report Preparation



Report preparation history

- 2019-06:
 - user selection from: Isf accounting (info from kerberos lists and mailing lists);
 - survey tool kit (limesurvey: <http://sondaggi.enea.it/index.php/>): user list, mails;
 - author tool kit (reporter: <http://reporter.enea.it/>): templates;
 - some tools for the reporter system:
 - <http://reporter.enea.it/repsummary2b.php?order=date&root=206;>
 - <http://reporter.enea.it/userlist.php?order=date;>
 - [http://reporter.enea.it/findroots.php;](http://reporter.enea.it/findroots.php)
- 2019-06-12: invitation mail (~88 invited users);
- 2019-09-14: first deadline (~20 contributions only, despite the many reminders);
- 2019-[10/11]: deadline extensions, reminders, solicitations, mails, review;
- 2019-12: last contribution (Alderuccio - 19th December);
- 2019-12: authorization process for the publication by REL-PROM;
- 2019-12: final check, author index, samples for the cover (by A.Trolese);
- 2020-01: press & dissemination;
- 2020-02: presentation prepared (this presentation).

- ◆ 50 printed copies, distributed by the ICT administrative office
- ◆ Compressed PDF version online:
<https://www.enea.it/it/seguici/pubblicazioni/edizioni-enea/2019/cresco-results-2018>
https://www.cresco.enea.it/CRESCO_reports/

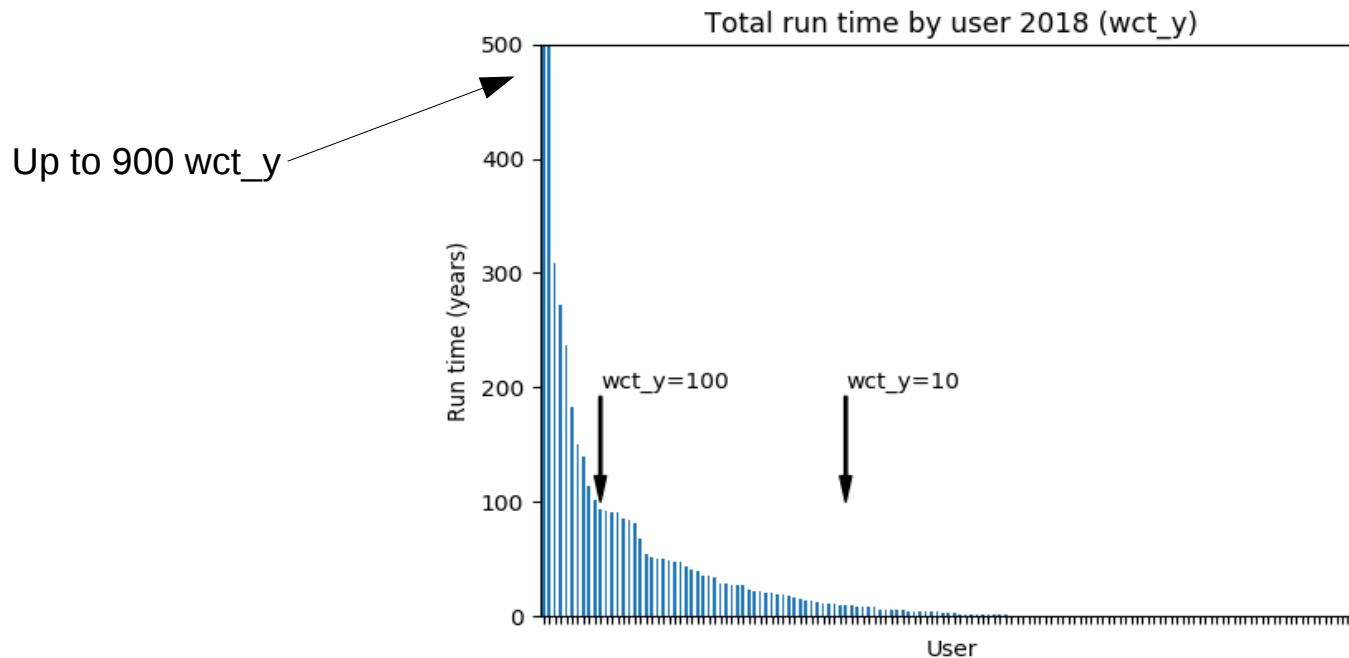
Invited Users

88/144 users invited

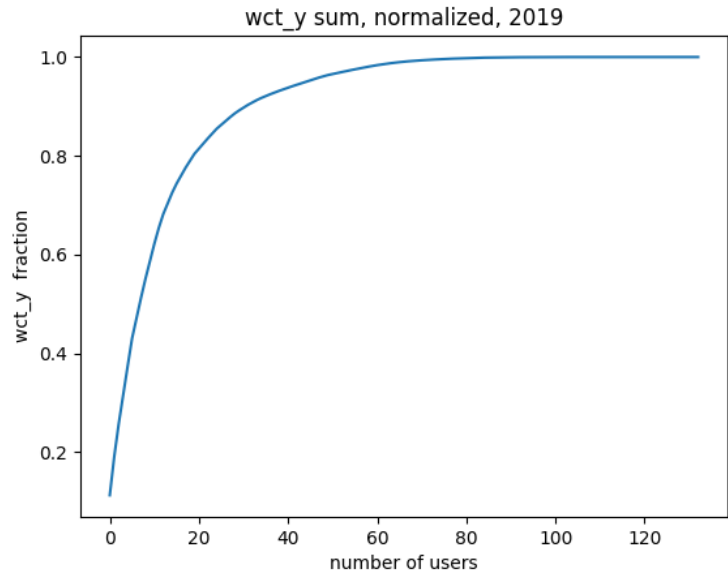
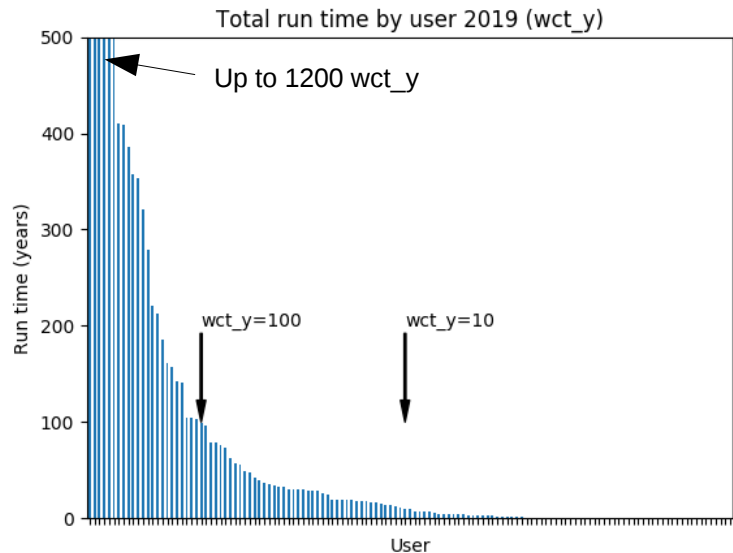
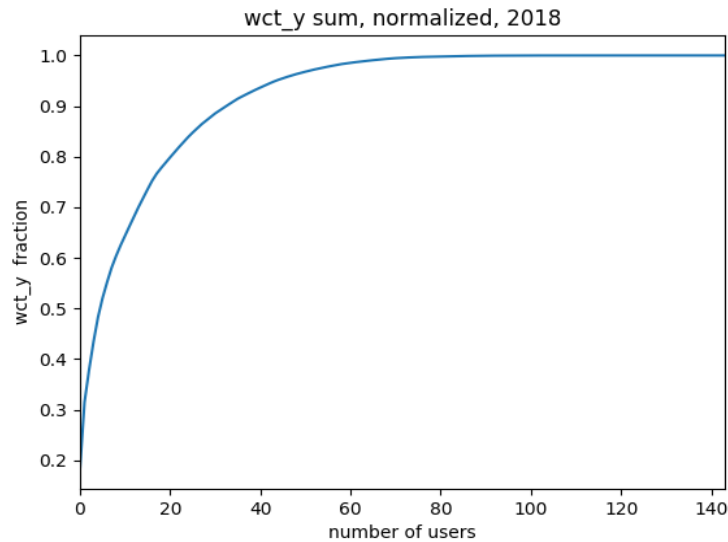
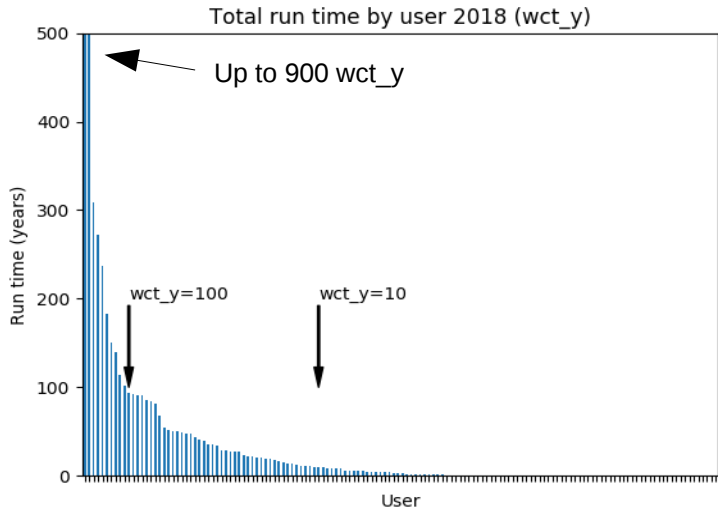
Selection criterium is:

wct_y > 1.0 || (wcty > 0.5 && njobs > 500 && av_totmem > 100000)
[in 2017/2018: wct_y > 1.0 || njobs > 100 || av_mem > 1000]

wct_y: total wall clock time (years)
njobs: number of submitted jobs
av_mem: average requested memory per core (MB)
av_nc: average number of used cores
av_totmem: av_nc*av_mem



Wall clock time by user



In 2019

**~10 users are:
60-70%
of wct_y**

**~20 users are
~80%
of wct_y**

**Statistics
lead by
few power
users**

This has been reported
since the 2013
presentation
by Funel

Accounting

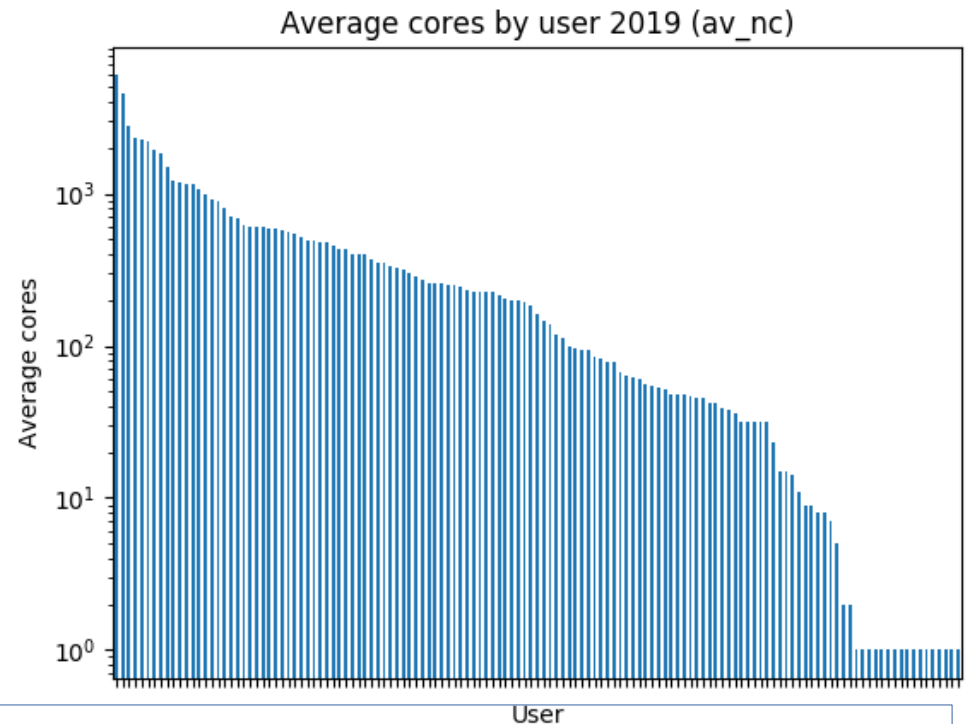
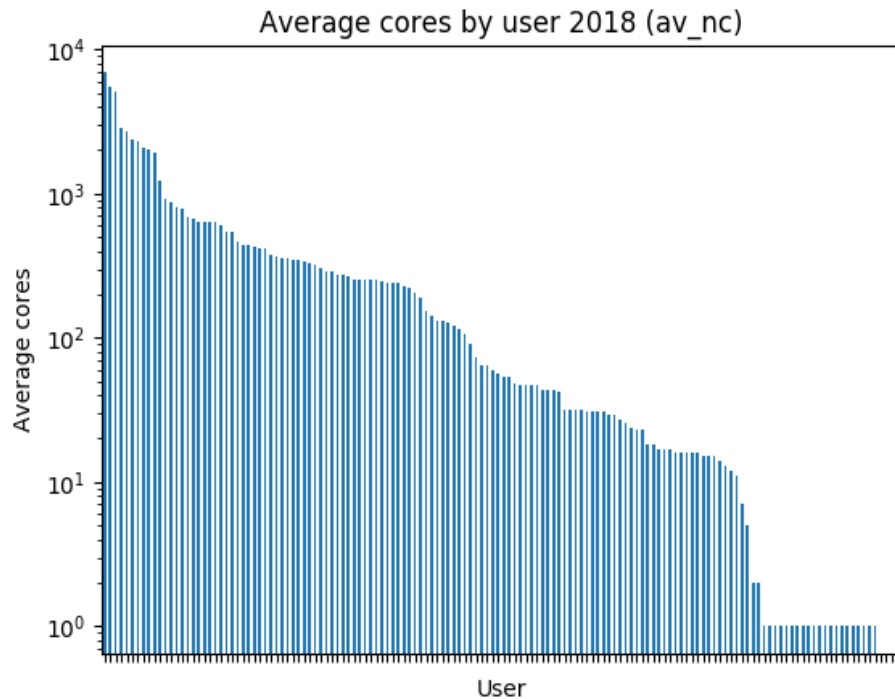
Accounting details 2018 - 2019

Cresco in 2019

Year	jobs	wct_y
2016	847184	4857
2017	571258	3895
2018	1321623	4853
2019	1675438	9992

In 2020	>2000000	>10000	?
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Average number of cores by user 2018-2019



Half users use more than 100 cores

Some users with more than 1000 cores in 2018-2019

CRESCO6 has ~20000 cores.

Will there be users who will use more than 10000 cores in 2020?

No! There is a limit on LSF: up to 6144 cores (unless system queue for admin).

The 2019 CRESCO Users

Users 133

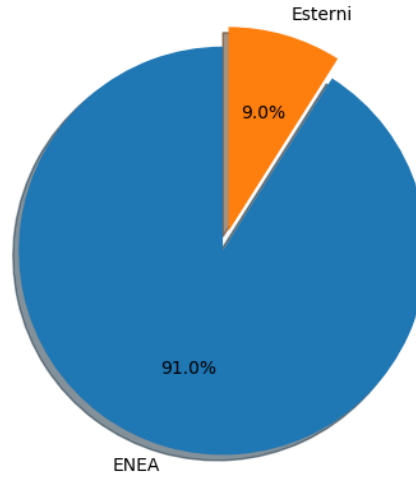
ENEA	97
DTE	34
FSN	38
SSPT	15
other	10

External	36
UniNa	10
UniRoma1	5
UniRoma2	3
CNR	2
UniFi	2
UniCal	1
UniSa	1
UniCam	1
UniBo	1
UniPg	1
UniRc	1
CRA	1
LTCalcoli	1
AriaNet	1
UNIRCJMadrid	2
UniZhejiang	1
UniBelgrade	1
AVIO	1

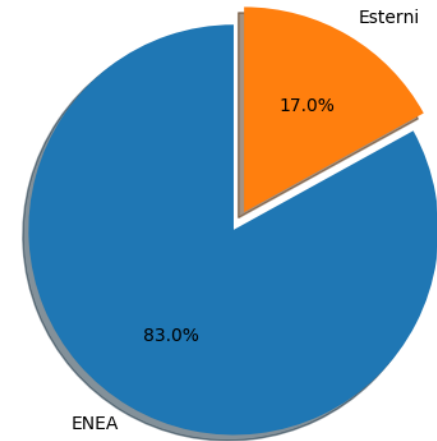
ENEA and External usage 2018-2019

2018

Number of jobs 2018: ENEA and External Users

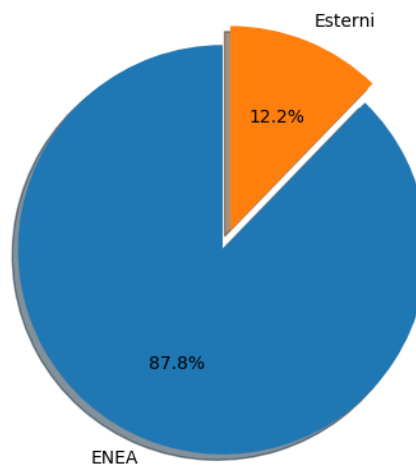


Total run time 2018: ENEA and External Users

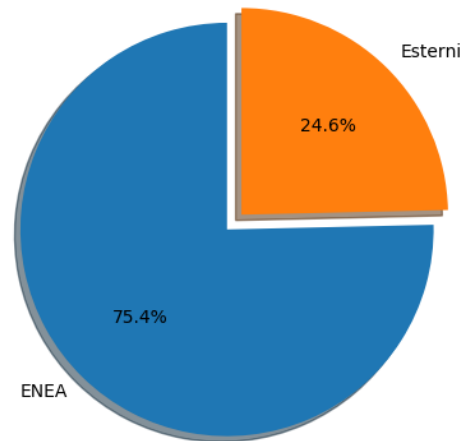


2019

Number of jobs 2019: ENEA and External Users

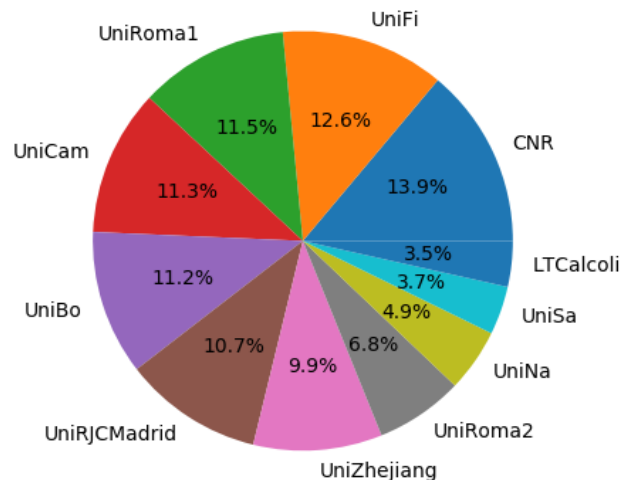


Total run time 2019: ENEA and External Users

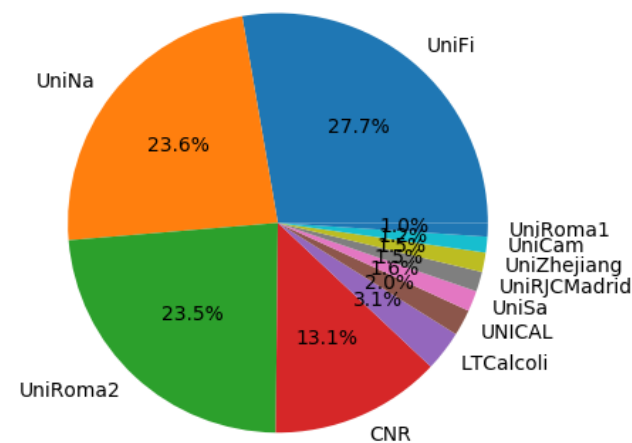


Usage by external institute – wct_y 2018-2019

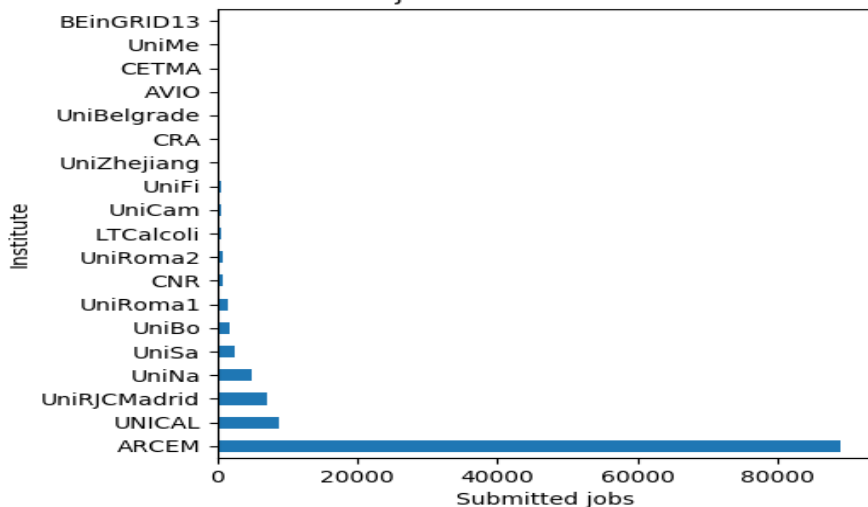
Total run time 2018 for external institutes (wct_y>10)



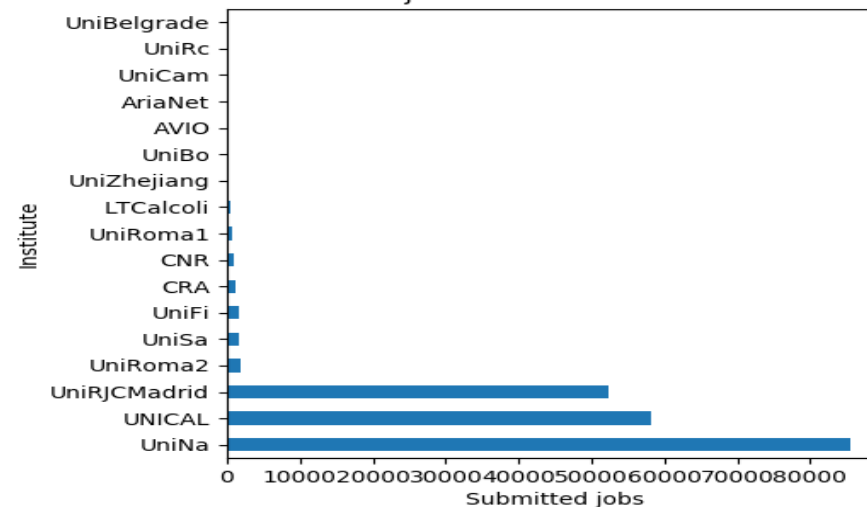
Total run time 2019 for external institutes (wct_y>10)



Submitted jobs 2018 for external institutes



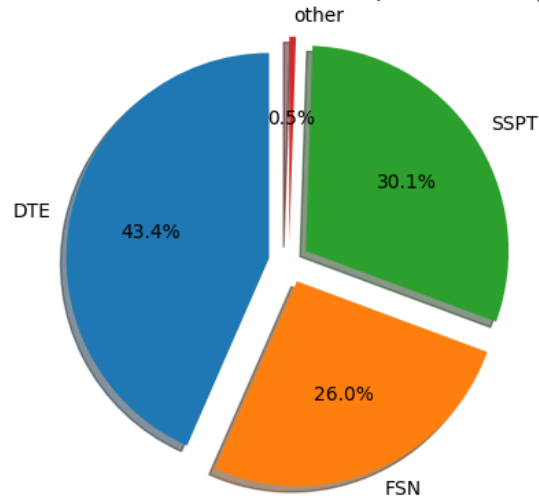
Submitted jobs 2019 for external institutes



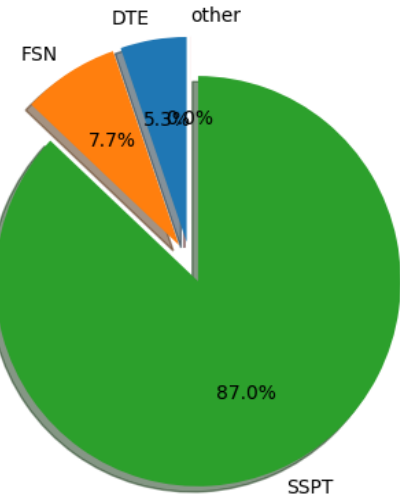
Usage by Enea department 2018-2019

2018

Total run time 2018 for ENEA department (wct_y)

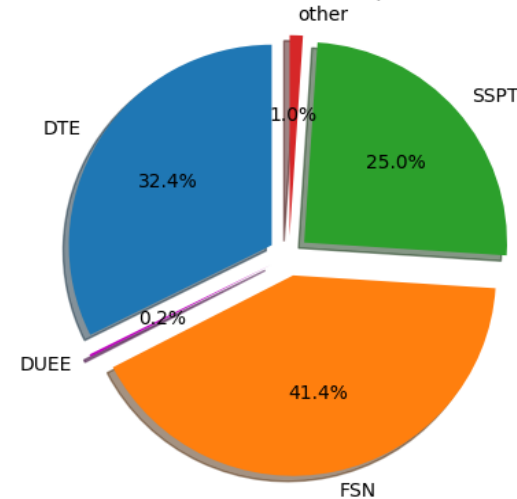


Jobs 2018 for ENEA department (njobs)

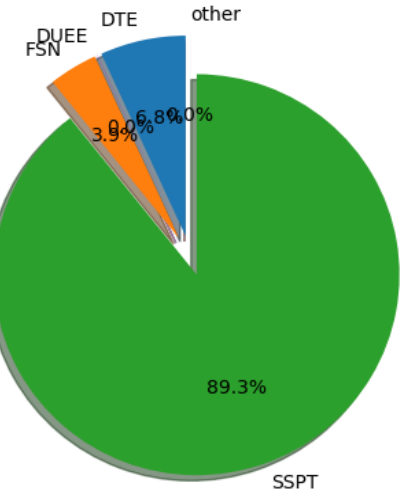


2019

Total run time 2019 for ENEA department (wct_y)

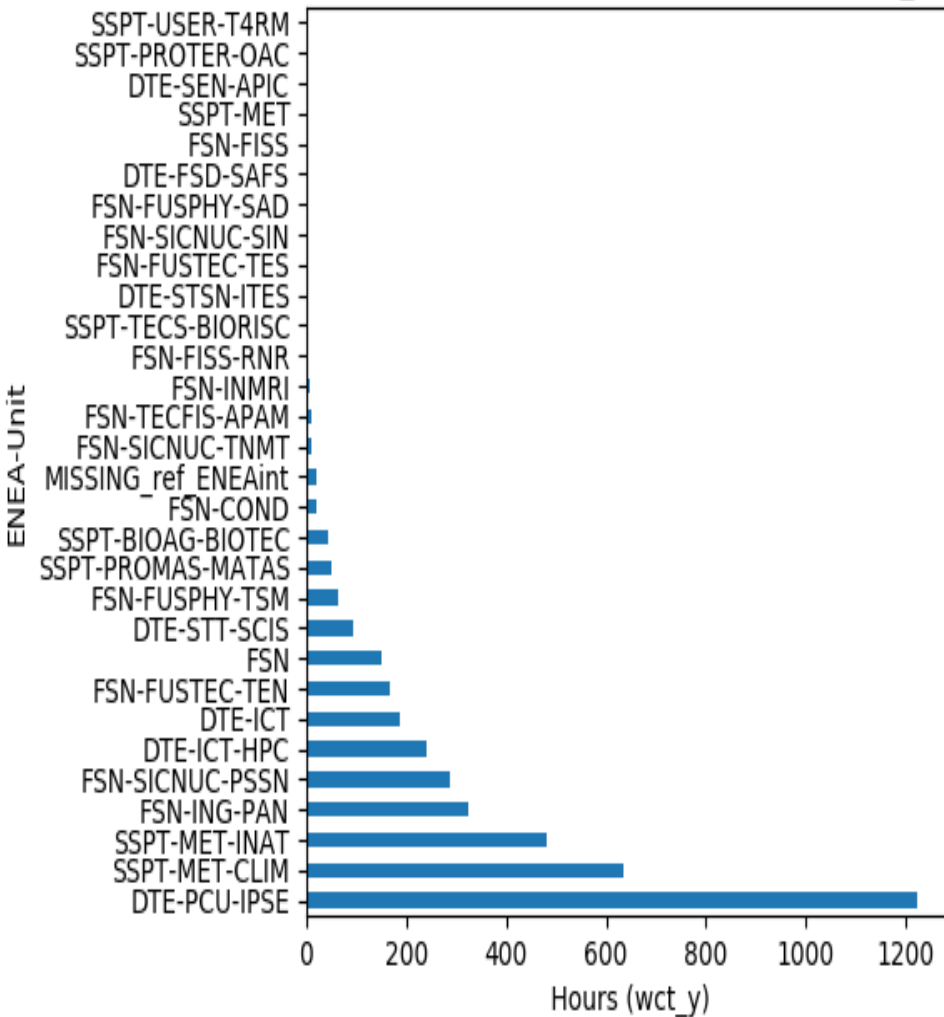


Jobs 2019 for ENEA department (njobs)



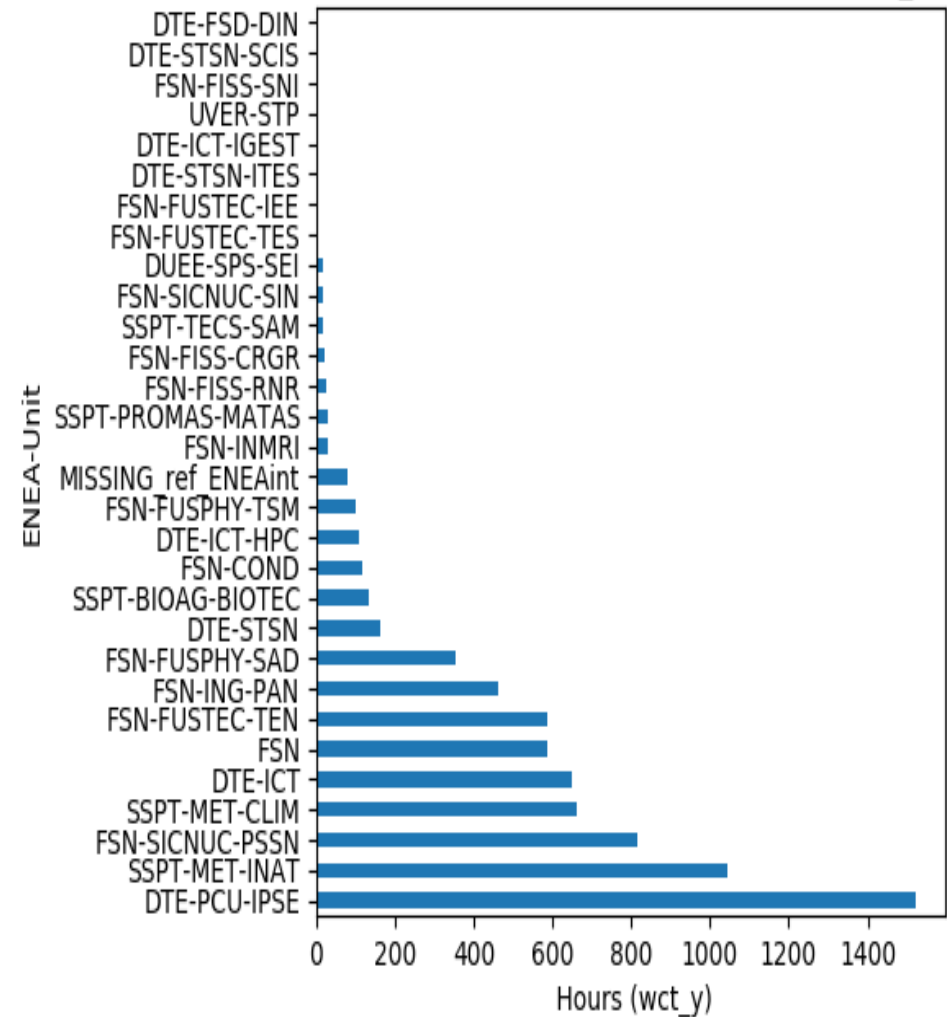
ENEA usage 2018-2019

Total run time 2018 for ENEA division (wct_y)



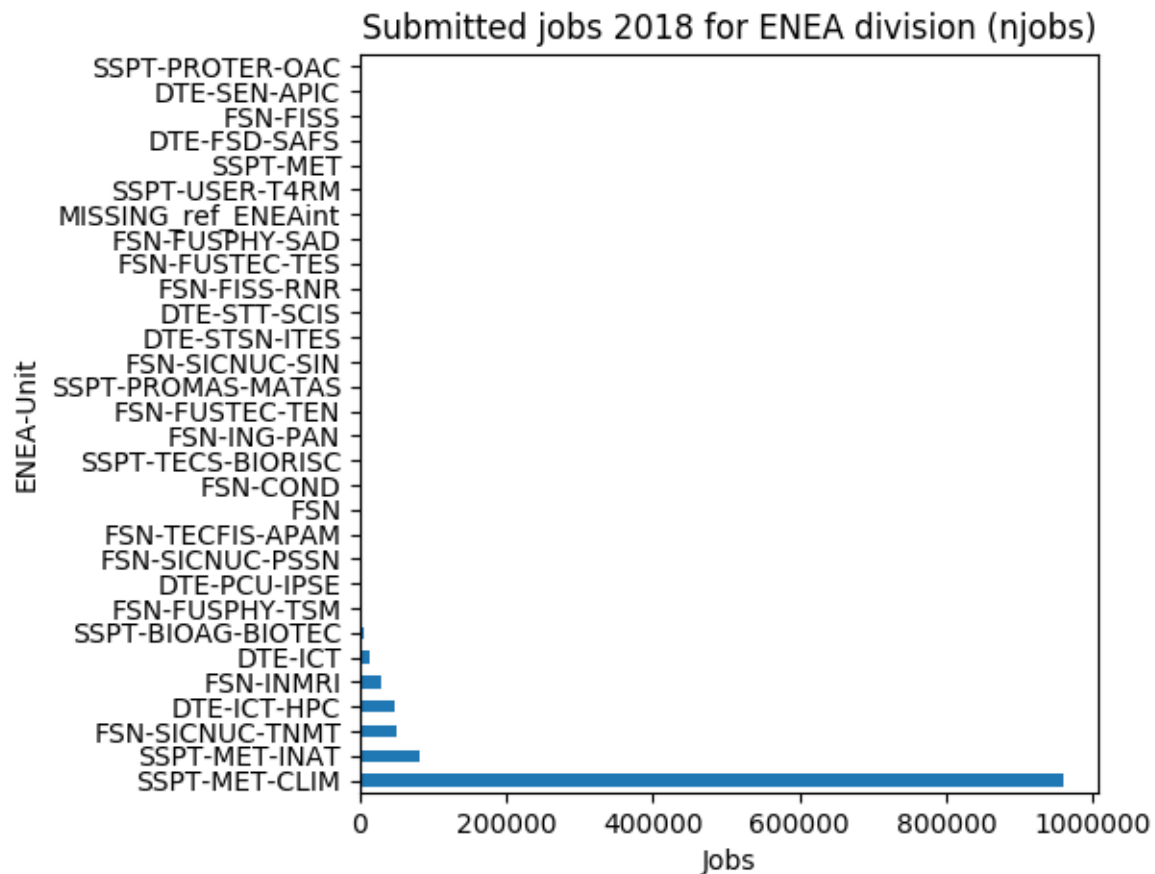
(DTE-PCU-IPSE :Giacomazzi, Picchia et al, combustion studies)

Total run time 2019 for ENEA division (wct_y)



(DTE-PCU-IPSE :Giacomazzi, Picchia et al, combustion studies)

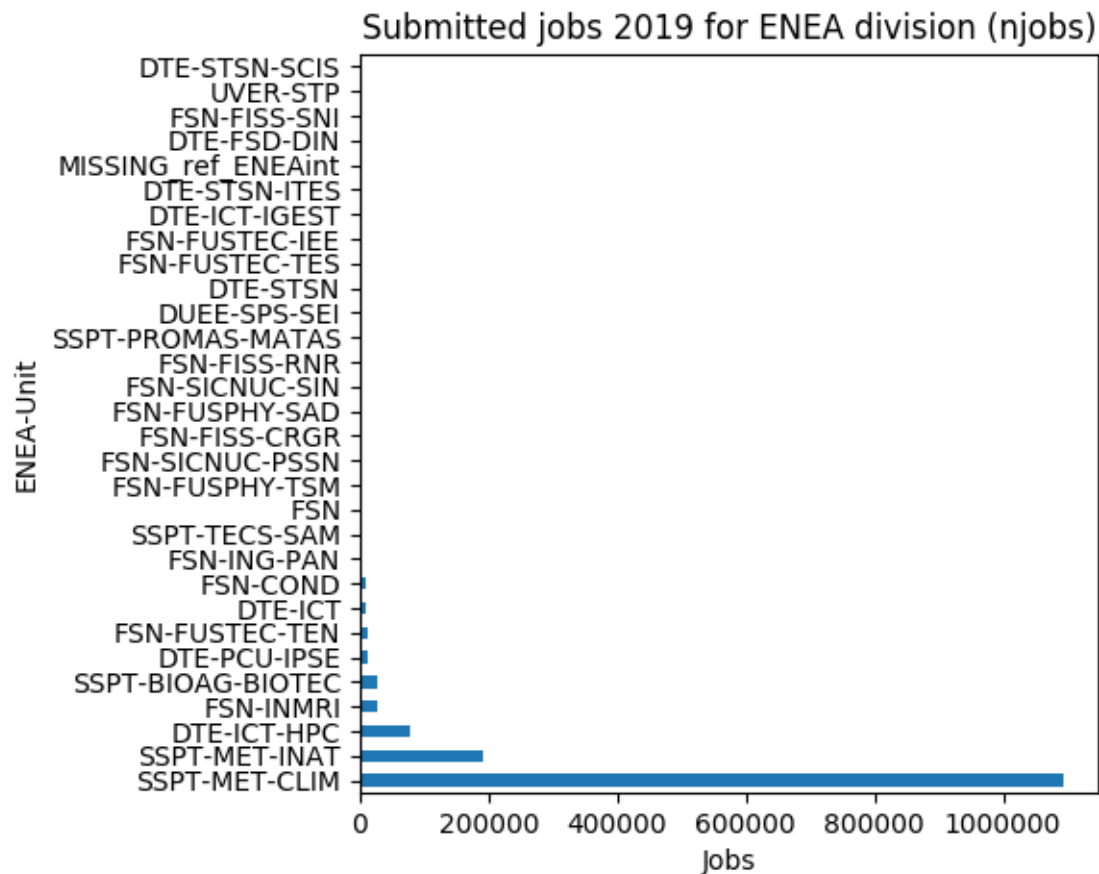
Usage by ENEA division - jobs 2018



Many jobs for climate and pollutants transport models

DIV	njobs
SSPT-MET-CLIM	959438
SSPT-MET-INAT	80145
FSN-SICNUC-TNMT	49882
DTE-ICT-HPC	46703
FSN-INMRI	29625
DTE-ICT	13311
SSPT-BIOAG-BIOTEC	5038
FSN-FUSPHY-TSM	3251
DTE-PCU-IPSE	2988
FSN-SICNUC-PSSN	2125
FSN-TECFIS-APAM	1866
FSN	1723
FSN-COND	1633
SSPT-TECS-BIORISC	1493
FSN-ING-PAN	1140
FSN-FUSTEC-TEN	780
SSPT-PROMAS-MATAS	377
FSN-SICNUC-SIN	342
DTE-STSN-ITES	200
DTE-STT-SCIS	189
FSN-FISS-RNR	133
FSN-FUSTEC-TES	133
FSN-FUSPHY-SAD	131
MISSING_ref_ENEAint	60
SSPT-USER-T4RM	28
SSPT-MET	19
DTE-FSD-SAFS	19
FSN-FISS	9
DTE-SEN-APIC	2
SSPT-PROTER-OAC	2

Usage by ENEA division - jobs 2019



Many jobs for climate and pollutants transport models

DIV	njobs
SSPT-MET	1283738
DTE-ICT	236251
DTE-???	50801
FSN-INMRI	27205
SSPT-BIOAG	26816
DTE-PCU	12599
FSN-FUSTEC	11732
FSN-COND	7499
FSN-ING	3709
FSN-FUSPHY	2916
SSPT-TECS	2805
FSN	2293
SSPT-PROMAS	2108
FSN-SICNUC	2019
FSN-FISS	1342
SSPT-PVS	880
DUEE-SPS	293
DTE-STSN	283
SSPT-PROTER	108
FSN-???	32
DTE-FSD	6
UVER-STP	3

Acknowledgments

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for the report cover design

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for the printed version and the internet distribution of the report

The whole CRESCO team:

always working hard to mantain the clusters alive

The CRESCO users:

for their contributions to the 2018 annual report

Any questions?

