Solar Radiation users feedback and further requirements for all MACC

MACC-III/Copernicus Atmosphere Services User Workshop
Rome, Italy

Claire Thomas, Transvalor
claire.thomas@transvalor.com

TRANSfer and VALORization

- 50 people
- SME created in 1984
- 5 M€ Turn-over
- 2 departments:

TRANSfer and VALORization

1. “FORGE”
   45 people
   350 installed sites
   CEMEF

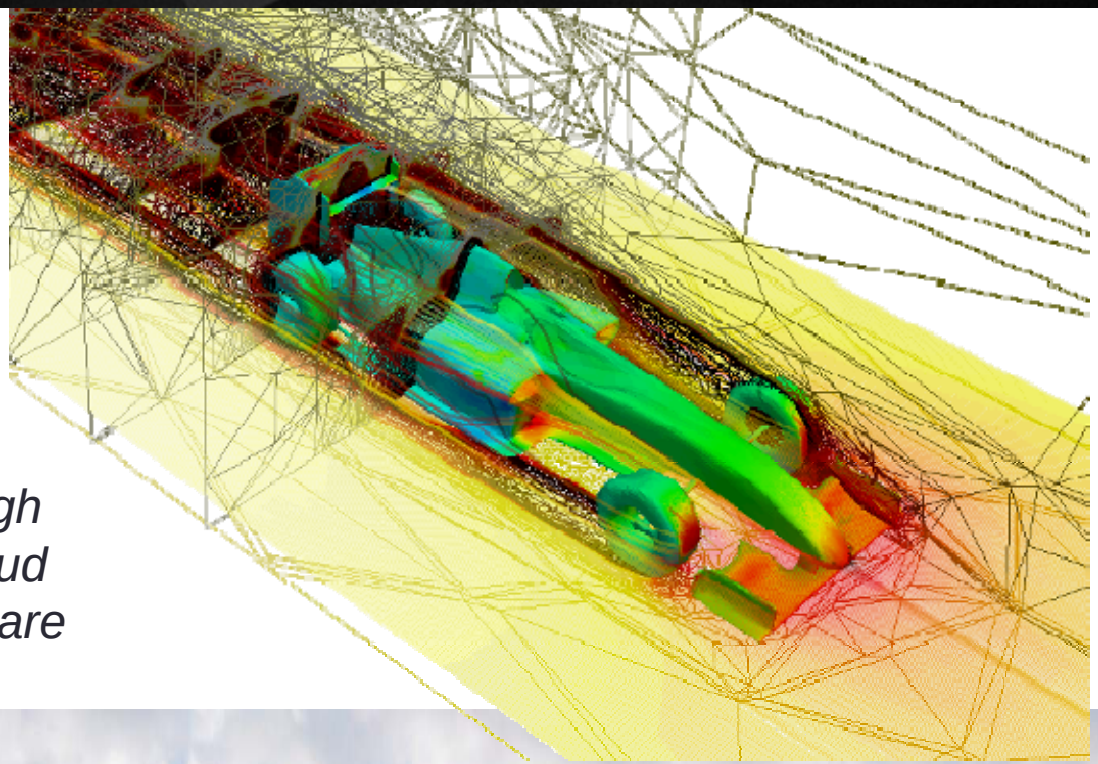
TRANSfer and VALORization

1. “FORGE”
   45 people
   350 installed sites
   CEMEF
2. “INNOVATIONS”

Transvalor Innovations

Aeromines: **Aero**dynamic, **Aero**thermal, **Aero**elasticity

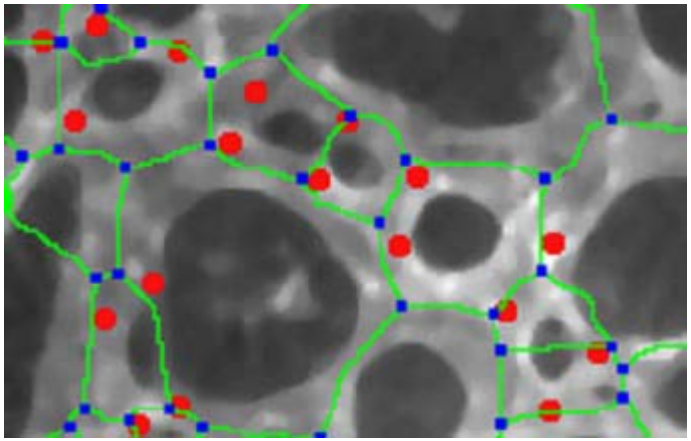
Supercomputing on Demand for challenging Simulations



- CEMEF

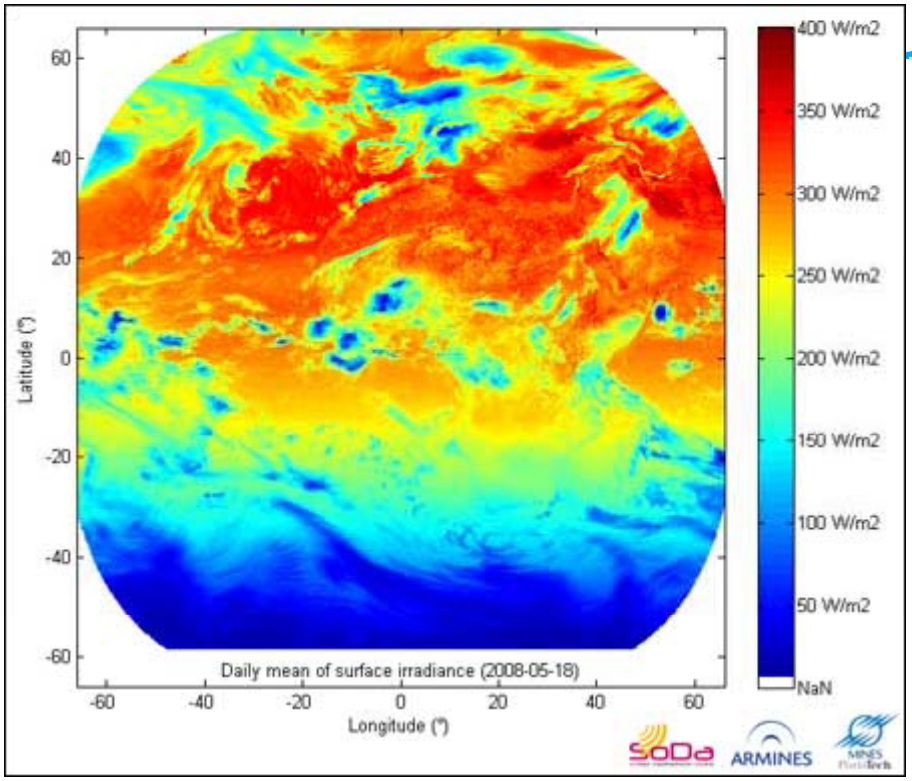
fluid structure high performance cloud computing software

Transvalor Innovations



- Library MORPH-M of the Center for Mathematical Morphology for 2 and 3D segmentations

Transvalor Innovations



- Valorization of the MINES ParisTech lab OIE in the domain of solar energy since Apr. 2009

The “Human faces” of SoDa at Transvalor

TRANSVALOR

The SoDa team
Working with O.I.E.
Sophia Antipolis, France

Etienne WEY
General Manager

Laurent SABORET
SoDa IT Support

Claire THOMAS
SoDa Support

The "Human faces" of SoDa at MINES ParisTech

Thierry RANCHIN

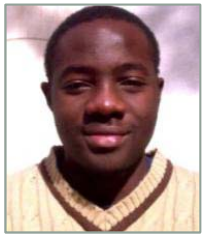
Observations Impacts Energies (O.I.E.)
Sophia Antipolis
Director: Thierry Ranchin

Philippe BLANC

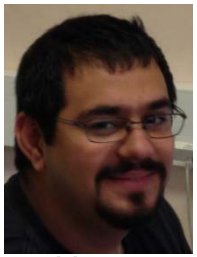
"Evaluation of resources"
Resp. of activity: Philippe Blanc

Lucien WALD

Lionel MENARD



William WANDJI NYAMSI



Youva AOUN

Yehia EISSA

… and many others

What is SoDa

- A project (**2003**)

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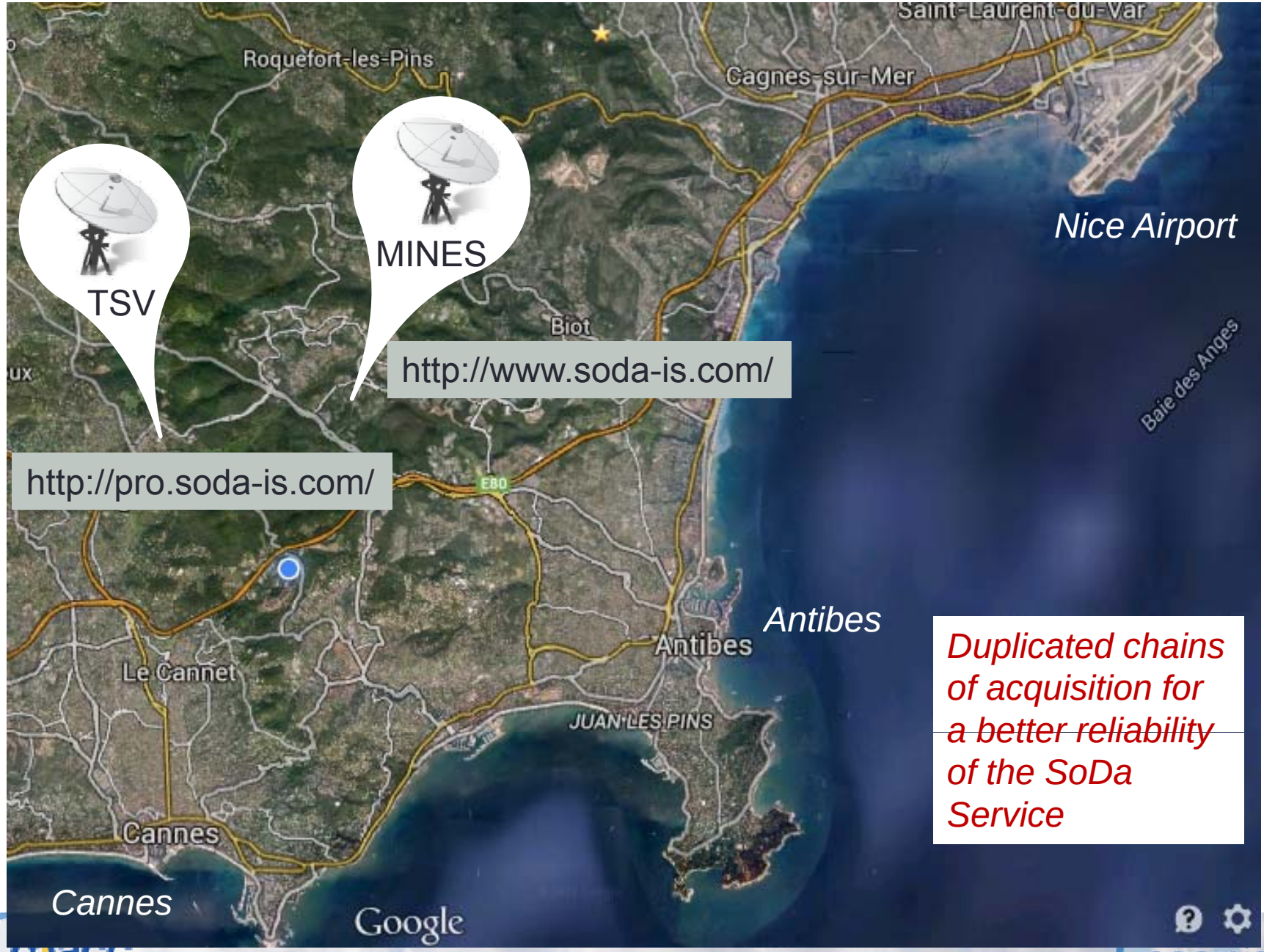

Duplicated chains of acquisition for a better reliability of the SoDa Service

What is SoDa

solar radiation data

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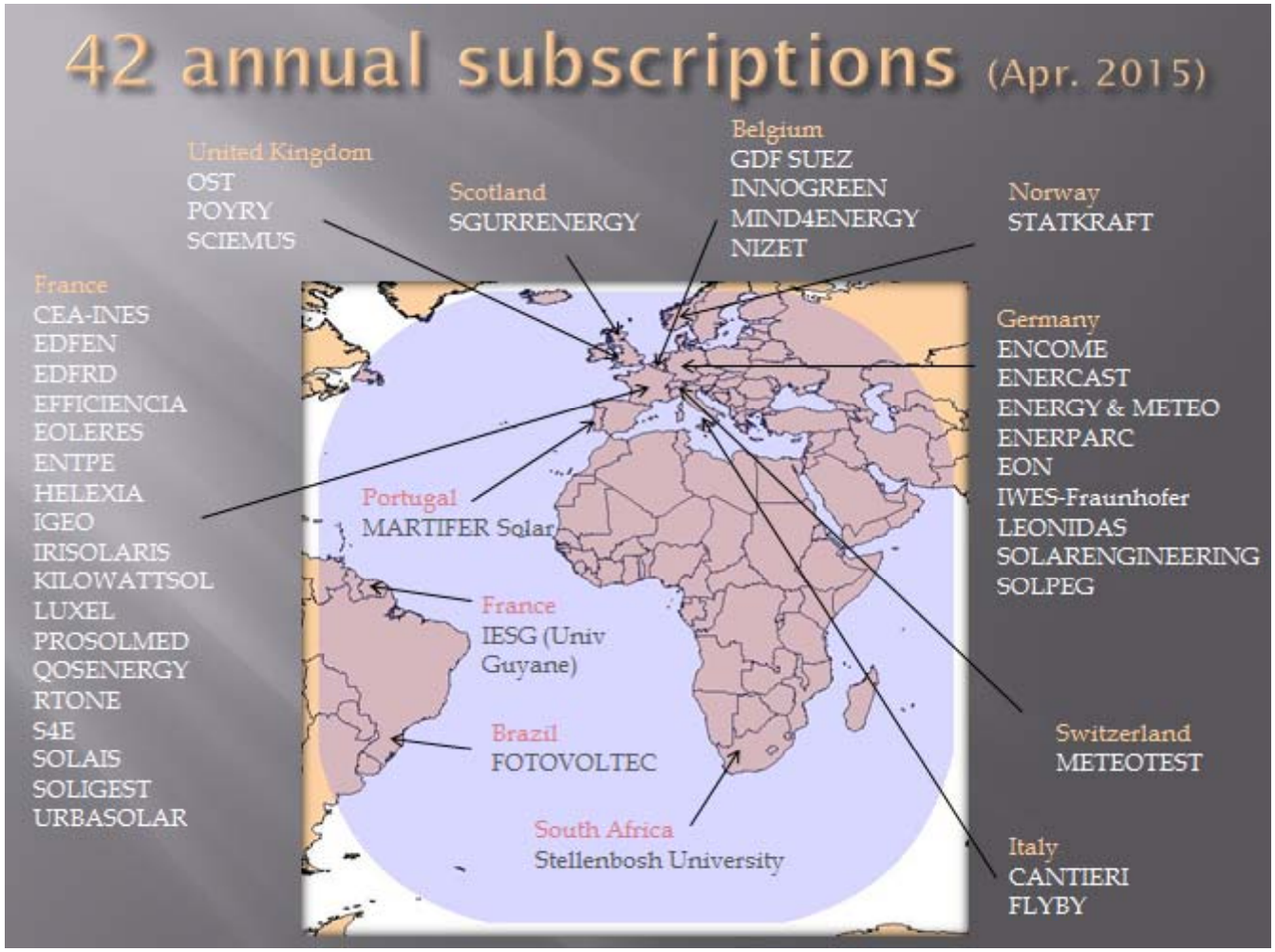
- More than 70 testimonies


Solar Energy Services for Professionals
Search...
SoDa
solar radiation data
HOME
ABOUT US
WEB SERVICES
MAPS
SODA PRODUCTS
RESEARCH & TRAINING
PRESS
FAQ
HELP
CONTACT
TEST
HOME
The SoDa Service is a broker to a list of services and webservices related to Solar Radiation proposed by several providers in Europe and abroad.
The sign means that the page is currently under development:
First visit
Web services
Maps
SoDa products
Help
Research
FIRST VISIT
Dear visitor, welcome to this website related to solar radiation. Thanks also for your patience!
SoDa, this is more than:
NEWS AND EVENTS
Free training in solar radiation - 3rd session
Only 15 places left!
14-15-16 Jan. 2015, Sophia Antipolis.
The fictional character Paul, from the also fictional company SunnyFlower, has been required by the banks to provide a complete bankable report for the sitting and sizing of a solar system somewhere on the planet. From the very beginning of this project construction, you will share the difficulties of Paul in finding reliable, long term, homogeneous and low uncertainty irradiation values. You will learn how to find your own data, avoid traps, and sharpen your critical skills regarding the existing resources.
On 16 Jan. 2015, we will particularly focus on the users of HelioClim services and products; a good opportunity to ask your questions, share your experiences and require new developments.
If you want to hear the story of Paul, come and join us for this training oriented on real test cases to introduce you with the bases as well as the most advanced technics in solar radiation and solar energy engineering.

Current annual subscriptions



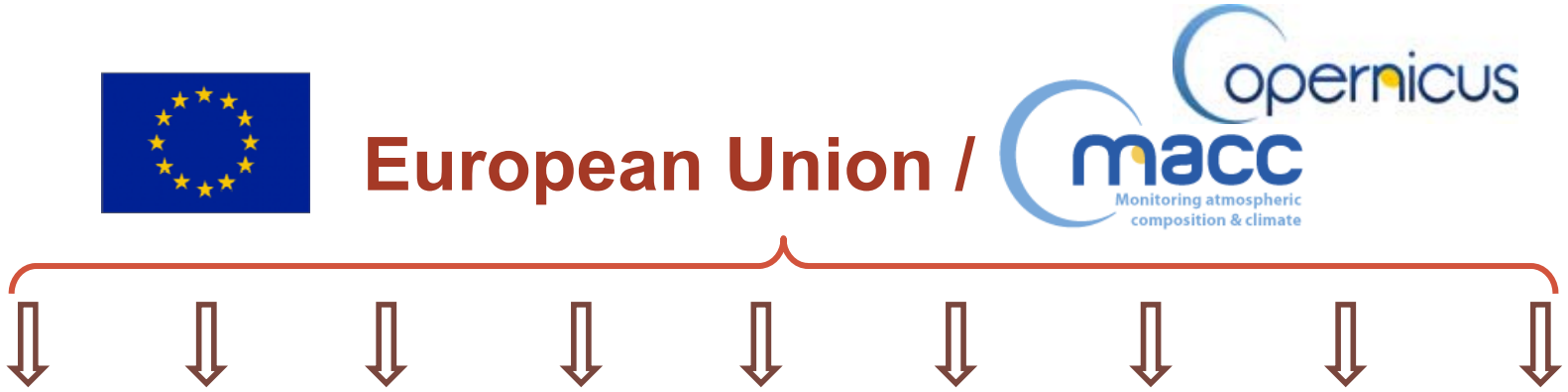
Profiles of the SoDa Users

- Larges companies (EDF EN, RES-MED, ENERCAST, OST…)
- SMEs (FLYBY, VOLTALIA, FOTOVOLTEC…)
- Research centers and universities

- Countries of users: worldwide, mainly Europe, but also Morocco, Brazil, South Africa…
- Domains: **solar energy**, and to a less extent daylighing, hot water, material aging…

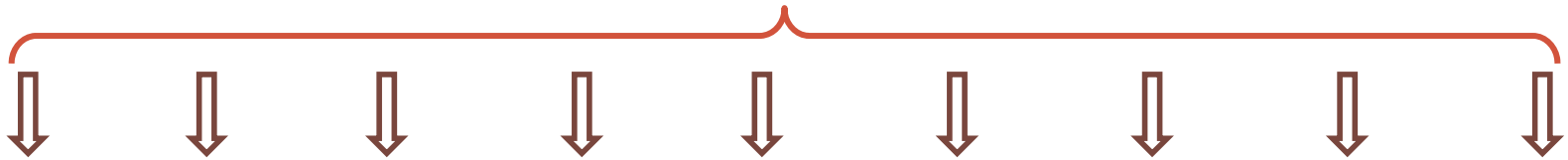
- SoDa indirectly reaches even more users thanks to large companies => value added services based on SoDa data

Interconnections: or how to reach end-users



How to reach end-users

European Union /



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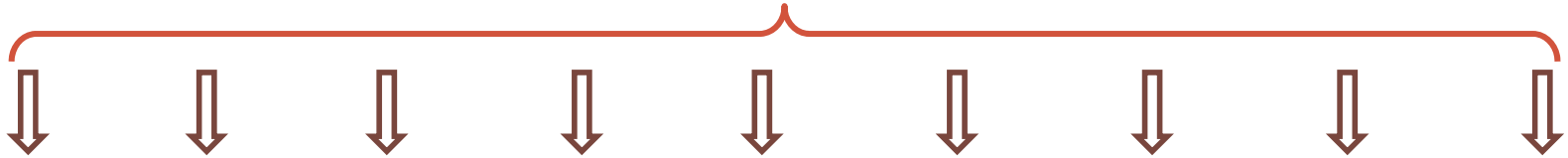

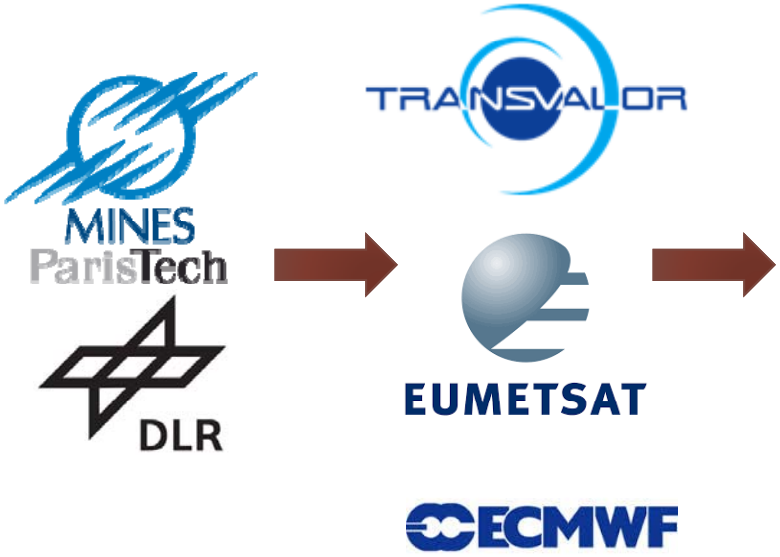

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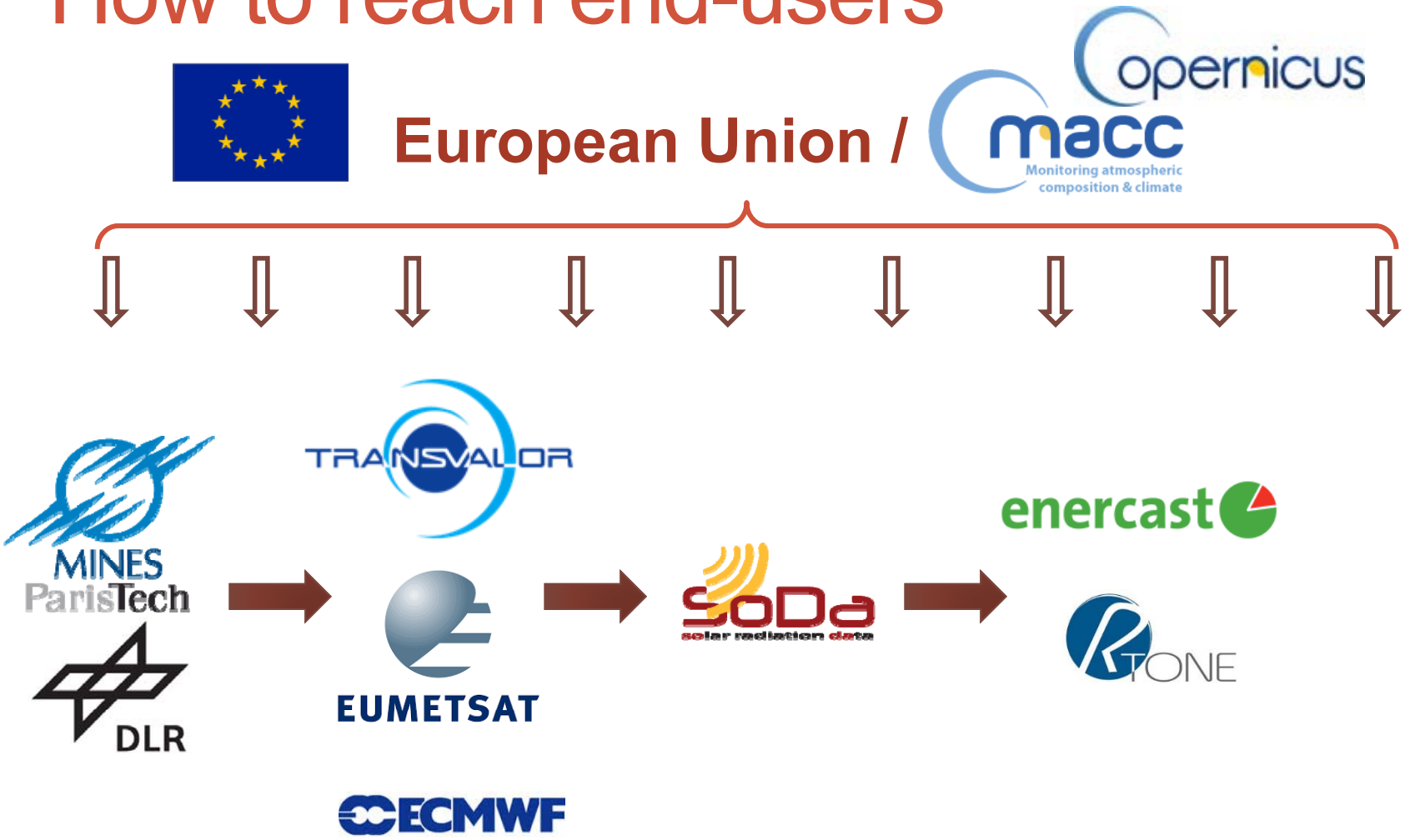

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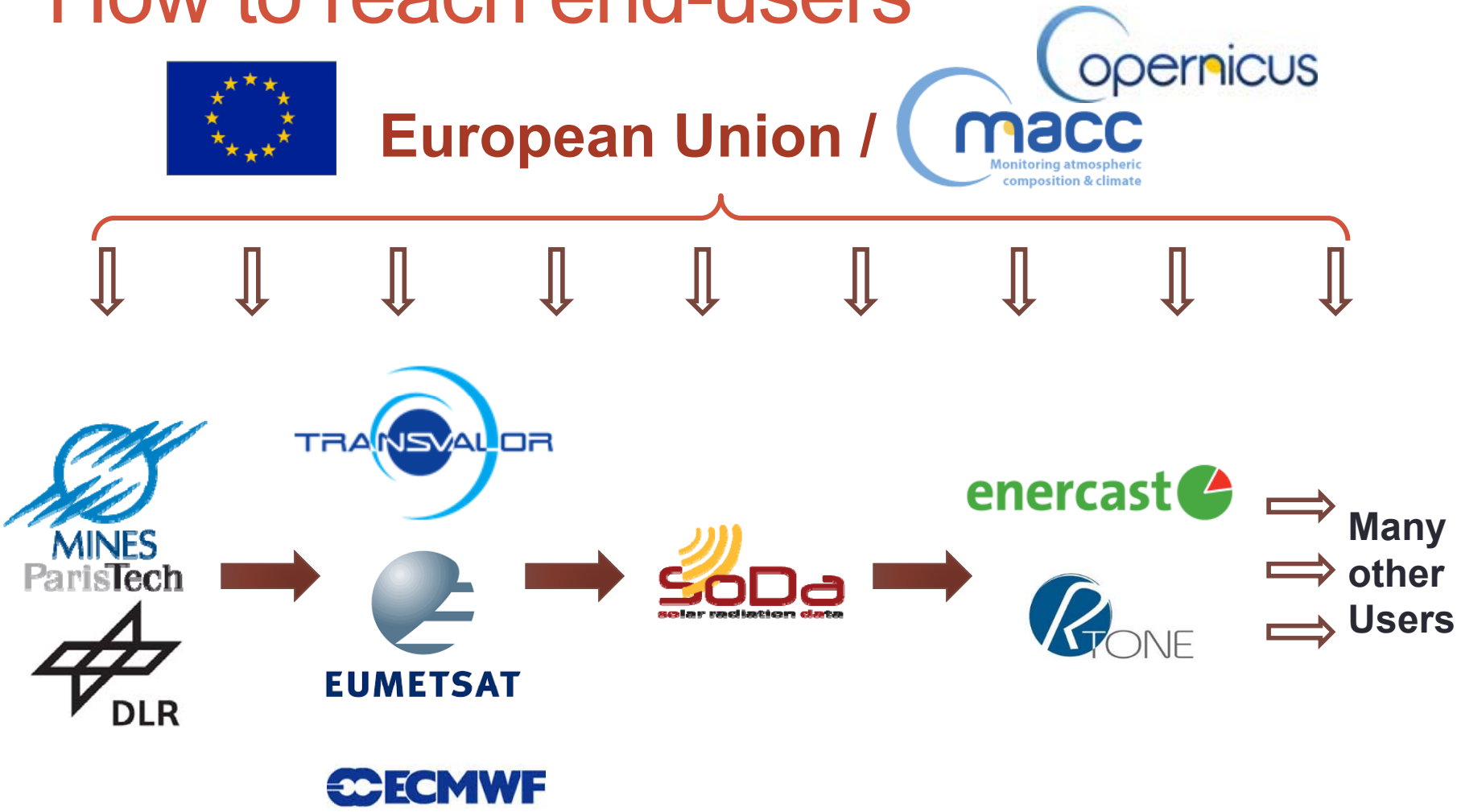


What are these two services in solar energy

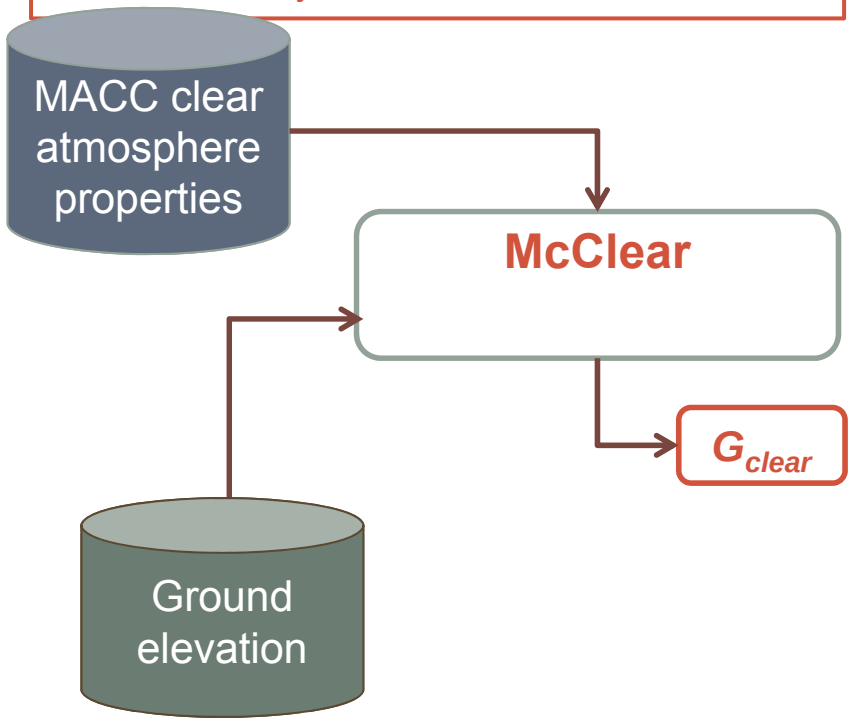
- **McClear service** => radiation components under clear sky conditions
  Worlwide, from 1 min to 1 month, from Jan. 2004 to d-2

- **MACC-RAD service** => radiation components for the actual weather conditions.
  Meteosat coverage, *from 1 min to 1 month, from Feb. 2004 to d-2*

McClear

Pclear : clear atmosphere variables from MACC analyses (ECMWF)

- Every 4 h, 80 km for **ozone** and **water vapor** contents
- Every 3 h, 120 km for **aerosols**



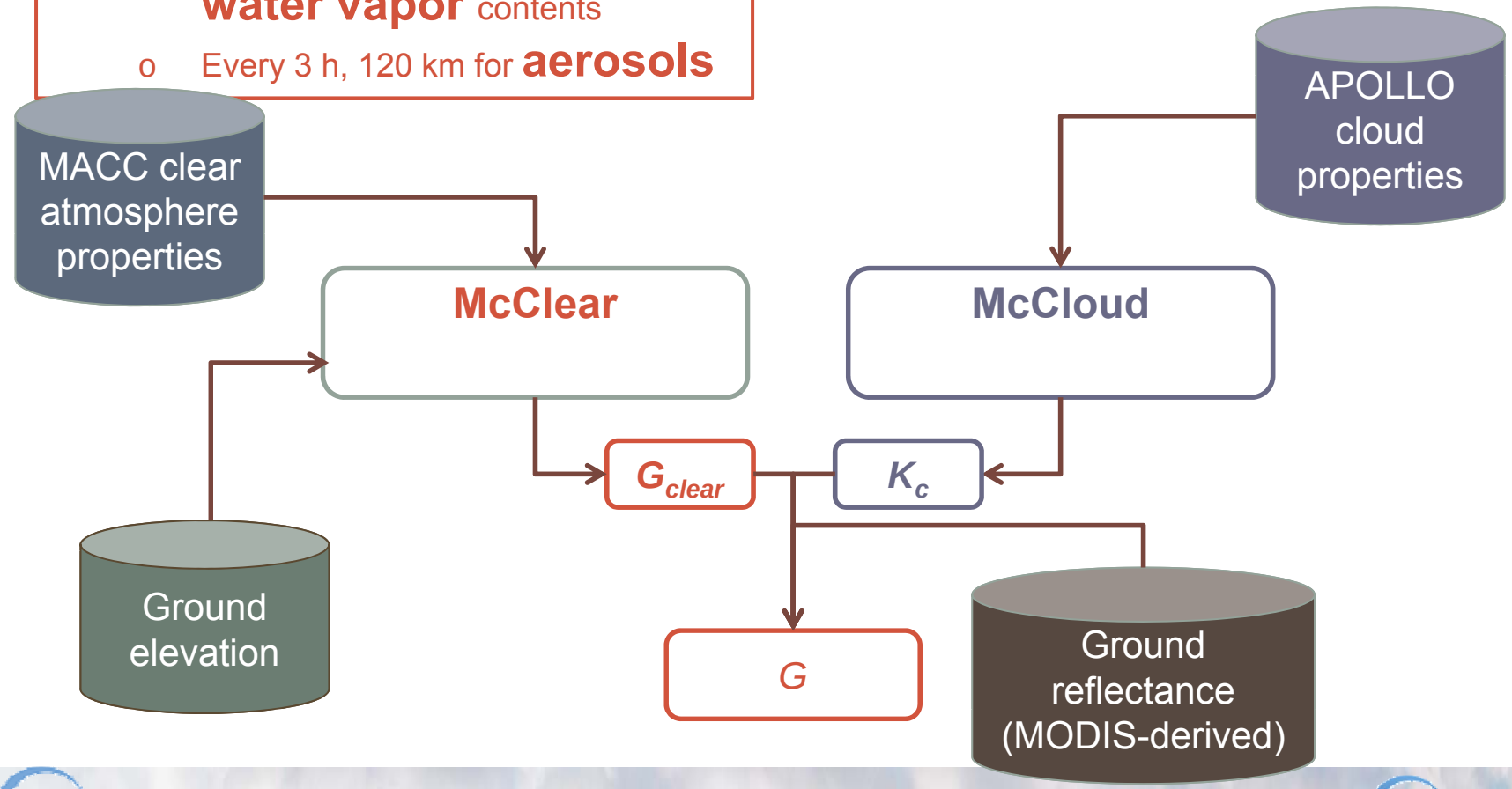
Heliosat-4 (MACC-RAD)

Pclear : clear atmosphere variables from MACC analyses (ECMWF)

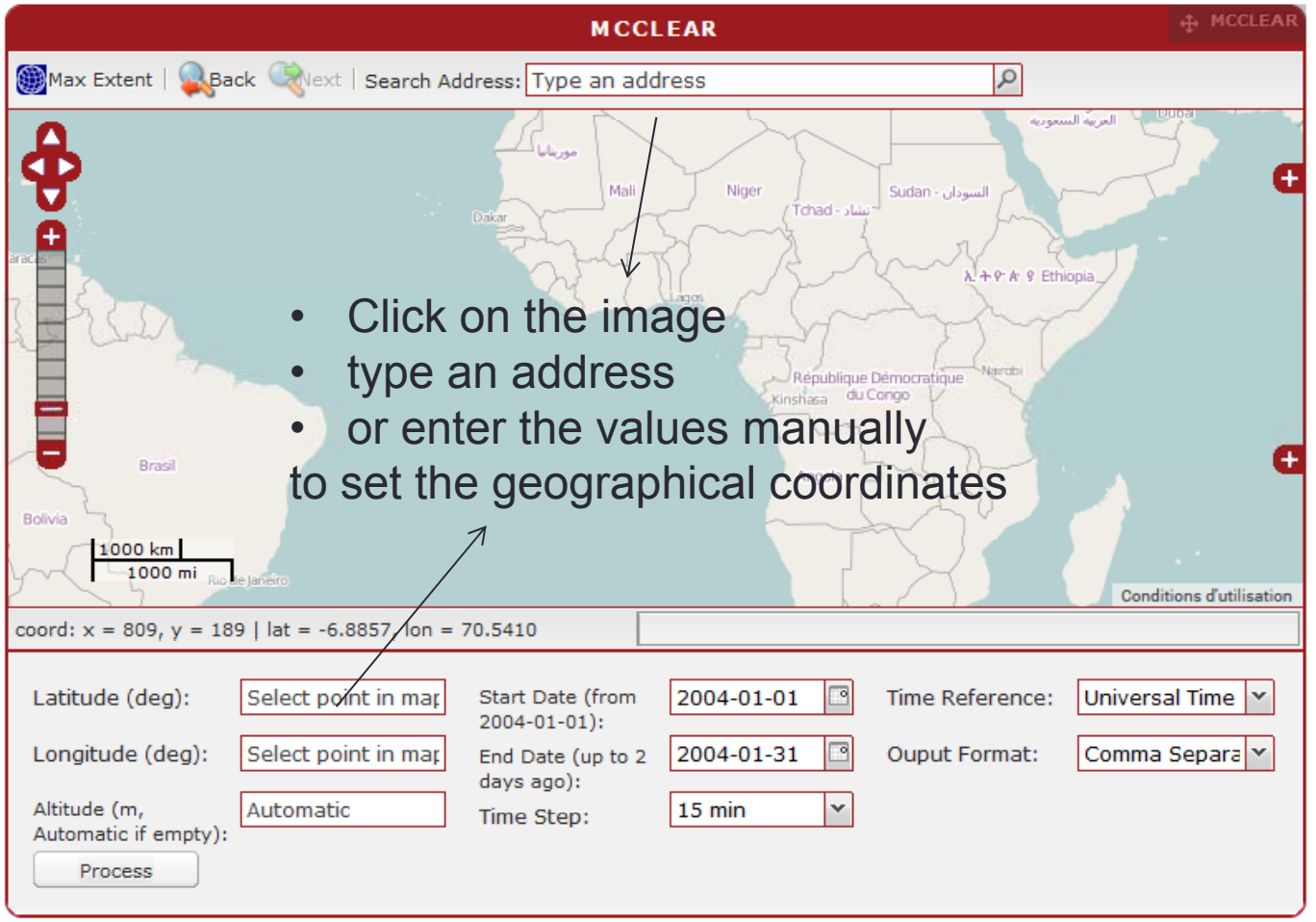
- Every 4 h, 80 km for **ozone** and **water vapor** contents
- Every 3 h, 120 km for **aerosols**

Pcloud : **cloud properties**

- From APOLLO method (DLR)
- Every 15 min, 5 km



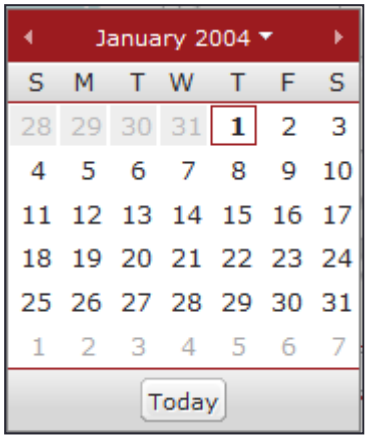
Access to McClear (= MACC-RAD)



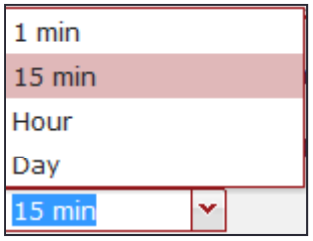
http://www.soda-pro.com/web-services/radiation/mcclear

http://www.soda-pro.com/web-services/radiation/macc-rad

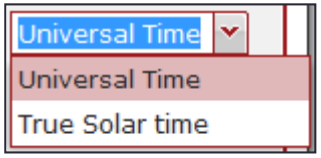
Inputs and output format



- First and last dates
- Time step



- The time reference



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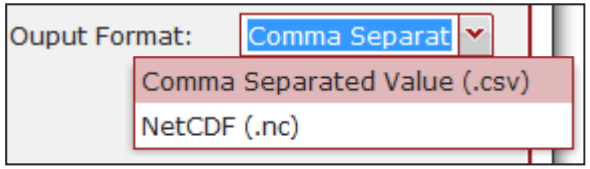
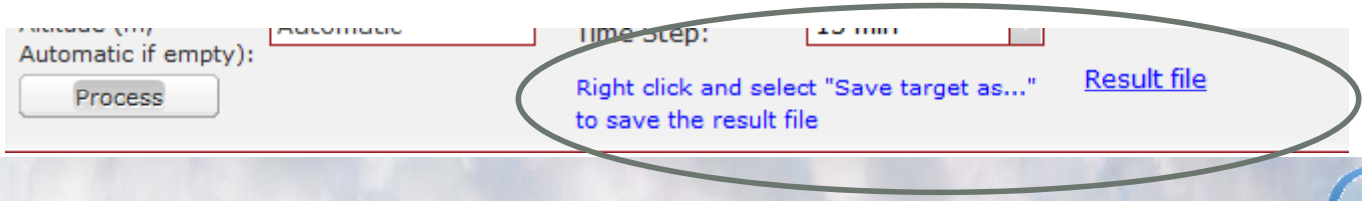


- Click right on the output file



HelioClim-3 version 5: a value-added service based on McClear

- Both services (even if still pre-op) are very promising and delivers high quality results.

- As McClear is pretty stable for more than two years now, Transvalor decided to propose a value added service which combines the cloud index together with the McClear service => HelioClim-3v5, which gives better statistical results than the previous version.

=> “controlled risk”

Advantages, for MACC

- Transvalor invested money, time and energy in this resource => **quicker access to McClear** time series.
- Moreover, the operational use of McClear enabled the correction of bugs, leading **to improvements of the base**
- Reliable services (backup server)

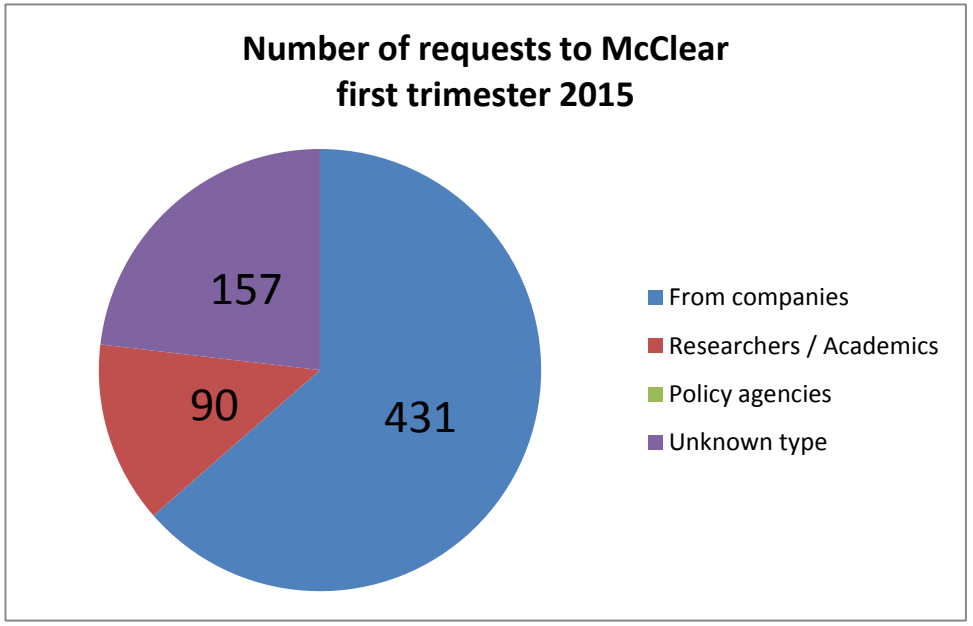
- Another advantage is that we are now able to give a **feedback to MACC from all our Users**

Advantages for the SoDa Users

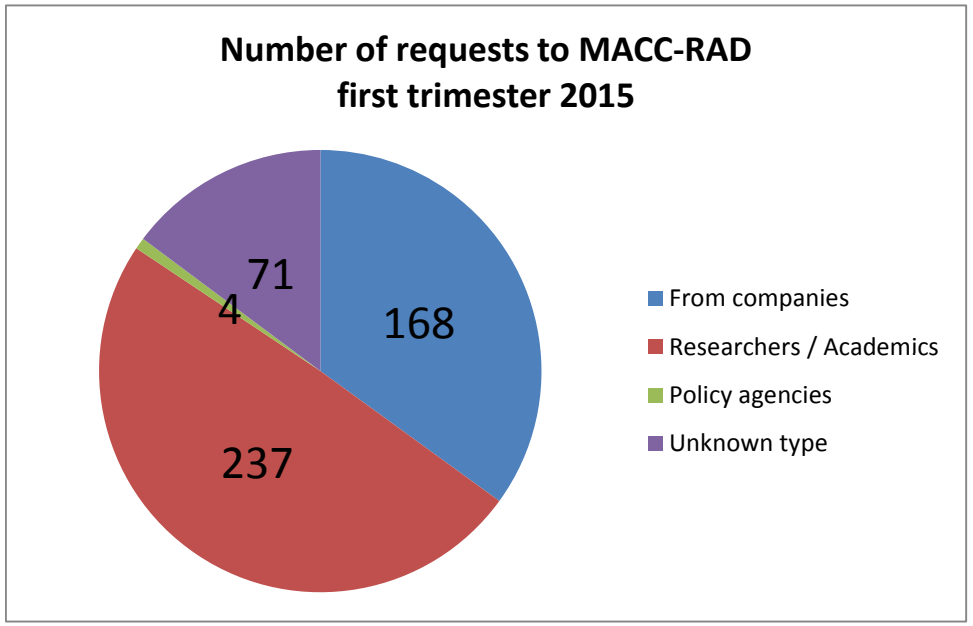
- Same standardized output => immediate adoption by users
- They can now benefit from this outcome of research **within their same commercial conditions** => No additional fee
- Many different **value-added services** are thus also immediately available for this v5 version.

So this is a win-win situation!

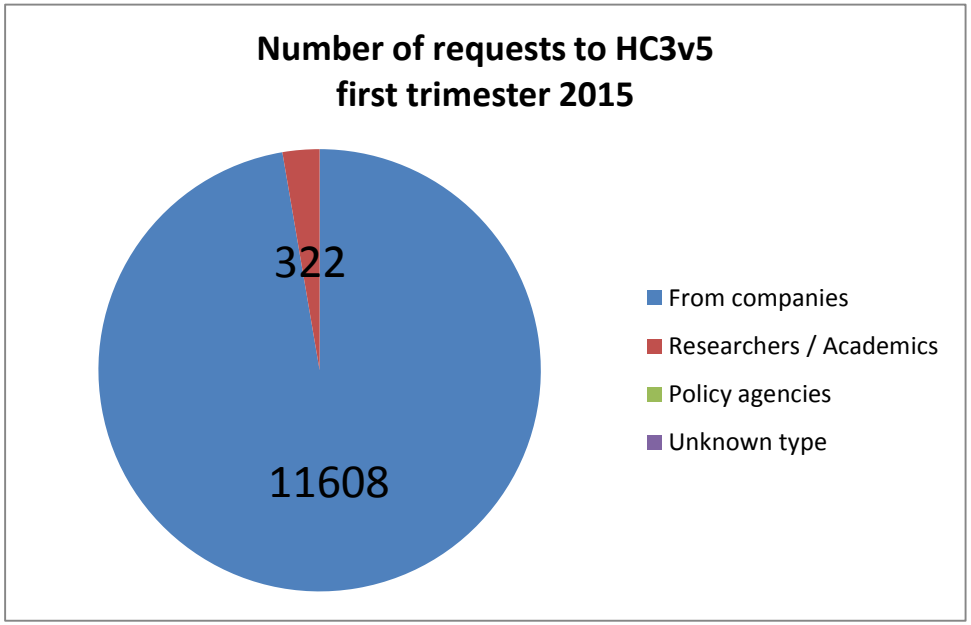
McClear access statistics



MACC-RAD access statistics



HelioClim-3 version 5 access statistics



Strategy for collecting feedbacks with McClear and MACC-RAD

- The data policy is that the services are available for free, with mandatory registration.

- Last June, a survey has been launched to gather the testimonies from the ~100 registered users for the MACC services => 3 emails have been sent to **each user** to finally receive ~50 feedbacks!
- => time consuming and… very boring task

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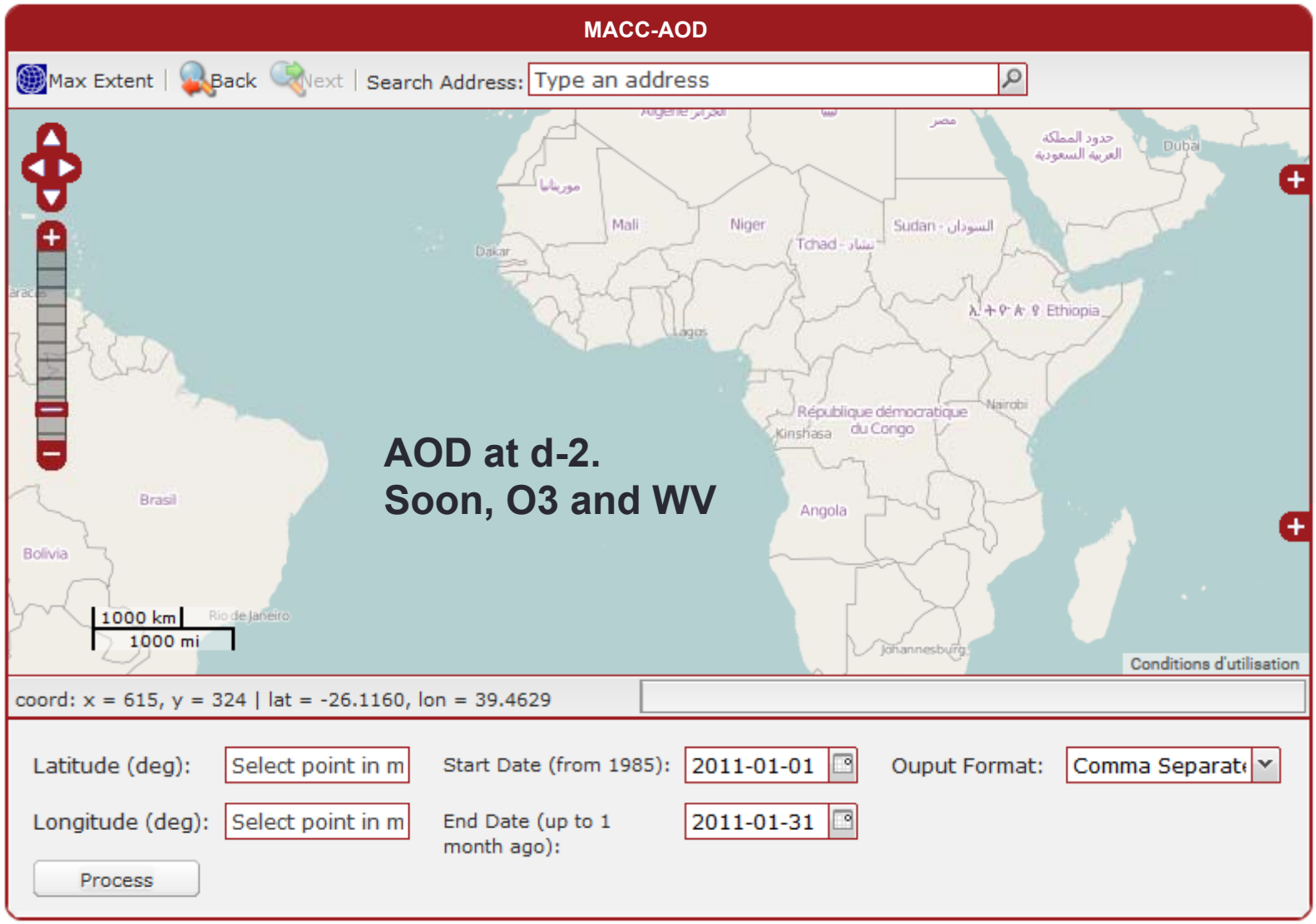
- Our proposal: manual registration against a pre-testimony, with the commitment to send an update later on => 100% answers

I have a surprise for you

- To fulfill the requirements of many users, we have developed the following precursor:



http://www.soda-pro.com/web-services/atmosphere/macc-aod

Mr. Christophe Vernay, technical director at SOLAIS, France

"As PV engineering office, we've been mandated by a customer to assess the effect of anthropogenic activity on the solar resource, for a site located in Asia, close to an industrial area. For that purpose, we have started working on clear-sky irradiance, using McClear service (also provided by SoDa) and have drawn first conclusions regarding the last 10 years during which clear-sky GHI decreased. Today, we need to go deeper in the analysis and better understand the root causes for such a decrease. This newly service, providing AOD details (black carbon, dust, sea salt, etc.) for any location in the Earth fully answers this need.

Thank you again for bringing such a scientific information to the PV actors.

30 Apr. 2015"

Other users of the SoDa MACC-AOD interface

- Mr. Pierre Ineichen, famous for his comparative survey of different solar radiation resources, is also testing the service.

- Mr. Marco Morelli, FLYBY, has been asking for this service for more than 2 years now, to refine his service on UV.

Conclusion

- So far, we proved that the two MACC services (McClear and MACC-RAD) for solar energy have a large audience by being available on SoDa
- This is also potentially the case for other data generated in MACC, and then in CAMS!

- Even if these services are still pre-op, the Users are very satisfied with these high quality data, and are also asking for more, and in particular:

Other users' requirements

- Standardized access to high quality radiation forecasts (short and long term)
- To temperature: archive and forecasts
- To typical meteorological years of all meteorological parameters, with also an automatic access to the data
- To UV data

- They also prefer to discuss by personal email of by phone to give their feedbacks and ask their questions, instead of cold and impersonal computer interfaces and forms.

Thank you!
END

A normal question would now be:

Why no operational / commercial solution is proposed based on MACC-RAD?

⇒McClear handles relatively low temporal (every 3 h) and coarse input resources, which can be stored on quick disk, but APOLLO (cloud info) gives one value every 15 min and every 5 km which is thus too large to be on quick disk => **time out reached for a 10 year MACC-RAD request.**

Another reason is that MACC-RAD is

⇒… still a pre-op service as well, but it will probably have changes in the near future, with no prior warning!

- March 2013: first tests only on 2013
- Nov. 2014: extension of the service until 2004

=> Not enough experience on the service to provide a commercial service based on MACC-RAD.

However, in Jan. 2016 we plan

- To develop a service based on MACC-RAD
- As it won't be based anymore on the cloud index, this will correspond to a new branch for developments => **HelioClim-4**
- Characteristics of this service:
  - Standardized outputs (other radiation components available)
  - Automatic access via wget
  - Quicker (optimization of the process and investments in large servers)
  - Data in real time instead of d-2

Analyse de déliverable avril 2015

- donner les raisons pour lesquelles des compagnies utilisent des services pré-op): for free, wolrwide, easy to access… comparer avec HC-3
- Cause H2O (WV) on peut pas faire de temps réel.

Transvalor Innovations

- Software for complex materials modelling from the Material center

Transvalor Innovations

- Chemical reactions and reactive transport software CHESS (CHemical Equilibrium of Species and Surfaces)

Transvalor Innovations

- Investments in technological companies

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