



Task Force: GT4	Design, development and implementation of <i>Renewable Energy Consumption Optimization Center</i> (RECOC)
Deliverable: D19a	Technical Guides
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RECOC MANUAL



INDEX

	<i>Pages</i>
A. HOSTS	3
HOST PLATON	3
HOST OSCAR	4
HOST ANA	5
OTHER HOSTS	6
HOST CALIPSO	6
HOST ODISEO	6
B. DATABASE	7
C. GUI	11
1. GUI (Main GUI)	11
2. ClusterPreprocessor	14
3. PruebaGraficos	15
4. Android GUI	16
5. SCADA	17
6. SCRIPITS	18
7. FUNDACIÓN DE HIDRÓGENO	23
8. WEB OPTIMA GRID	24
9. GOOGLE ACCESS	27
10. MODDLE OPTIMA GRID	28



A. HOSTS

HOST PLATON

Operative system: Linux – Ubuntu 11.04

User accounts:

Username: oscar
Administrator
Password:

Username: David
Personalised – Limited
Password:

Username: Enrique
Administrator
Password:

Username: optimagridftp
Password:

CONTAINS:

- ▮ **DATABASE:** is the database where we store the data about the consumptions, productions, aero generators... in our system.
- ▮ **GUI AGENTS:** is the graphic interface that does possible to interact with the consumptions and productions of the database.
- ▮ **SCADA:** In the desktop of the account of user 'oscar', there is an icon of the application "Optimagridv4", 4th version of SCADA to monitor the production and consumer of the energy of the Technology Park.
- ▮ **SCRIPTS:** are the scripts that update the database.



HOST OSCAR

Operative system: Linux - Ubuntu

User accounts:

Username: oscar
Administrator
Password:

Operative system: Windows 7 (License is expired)

User accounts:

Username: oscar
Administrator
Password:

CONTAINS:

- ▮ [GUI AGENTS](#): is the graphic interface that does possible to interact with the consumptions and productions of the database. This host have different projects that shows different GUI with different uses.



HOST ANA

Host for development.

Operative system: Windows 2007 Professional (64-bit Operating System)

User accounts:

Username: AnaMarcen
Administrator
Password:

Username: dchinarro
Administrator
Password:

Username: jmbergues
Administrator
Password:

Username: RECOC
Administrator
Password:

It has installed **Netbeans 6.9.1** and **MySQL Server 6.0**.



OTHER HOSTS

HOST CALIPSO

Operative system: Linux – Ubuntu 11.10

User accounts:

Username: david
Administrator
Password:

Username: oscar
Administrator
Password:

Username: session de invitado
Without password.

HOST ODISEO

Operative system: Linux – Ubuntu 10.04

User accounts:

Username: Redes1
Administrator
Password:

Hard disk (82 GB) with 3 partitions :

1. System of files (62GB) kind of partition: Linux(0x83)
2. System of files(17 GB) kind of partition: Linux(0x83)
3. Interchange area (3 GB) kind of partition: Interchange(swap) of Linux(0x82)

Netbeans 6.9.1 is installed but there are not projects.

[Note: this host has problems with connections in the long run, after several minutes it shuts down; we keep it to carry out proofs.]



B. DATABASE

Access Data of Mysql:

HostName: localhost
Host: 213.98.14.77
IP address: 10.10.10.100
Subnet mask: 255.255.255.0
Port: 1500
Gateway: 10.10.10.4

Users: at this moment, there are nine user accounts with different types of permissions.

```
[1][Administrator] User:  
root Pass:usj_optima_recoc  
Permissions: all permissions
```

```
[2][@localhost]  
User: debian-sys-maint
```

```
[3]  
User: optimaUser  
Pass: o_p_t_u_s_3_r  
Permissions: he can realise 'selects', 'inserts', 'updates'  
and 'deletes' in the BBDD 'consumos',  
'generacion' and meteorology'.
```

```
[4]  
User: user_scripts  
Pass: jGqgftg43k  
Permissions: he can realise 'selects', 'inserts', 'updates'  
and 'deletes' in the BBDD 'consumos',  
'generacion' and meteorology'.
```

```
[5]  
User: pruebas  
Pass:  
Permissions: he cannot access to any table of the BBDD.
```

```
[6]  
User: optimagrid  
Pass:  
Permissions: he can only realise 'selects' in the BBDD  
'consumos'.
```

```
[7]
User: invitado
Pass: invitado_optima
Permissions: he can only realise 'selects' in the BBDD
              'consumos'.
```

```
[8][User to work in RECOC]
User: uconsumos
Pass: optimacons
Permissions: he can only realise 'selects' and 'inserts'
              in the BBDD 'consumos'.
```

```
[9][User to students of fourth year]
User: lectura
Pass: lectura
Permissions: he can only realise 'selects' in all BBDDs.
```

Chained SSH connection:

```
mysql -h <mysqlHost> -u <mysqlUser> -P <portNumber> -p
```

In the Local Network:

```
mysql -h 10.10.10.100 -u root -P 1500 -p
mysql -h 10.10.10.100 consumos -u uconsumos -P 1500 -p
mysql -h 10.10.10.100 consumos -u invitado -P 1500 -p
. . .
```

In other network:

```
mysql -h 213.98.14.77 -u root -P 1500 -p
mysql -h 213.98.14.77 consumos -u invitado -P 1500 -p
. . .
```

Update of the Databases:

- 'consumos' is updated through several scripts that are in the host Platon.
- 'generacion': is updated thanks to Inycom. Inycom push updated data to our Database. (At this moment Enercon table is the unique that is updated)

The next figures give a general view of the organisation of data in the BBDD.

consumos

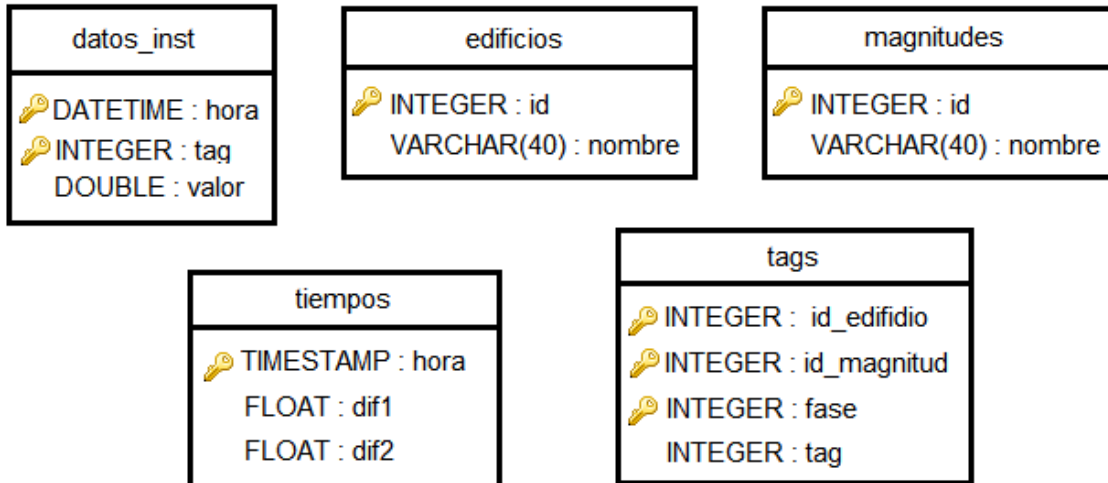


Figure 1. Schemadata 'consumos'

ecommerce

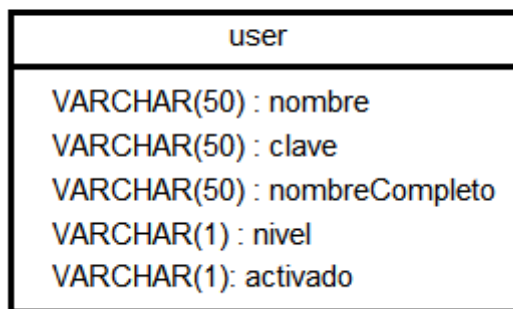


Figure 3. Schemedata 'ecommerce'

generacion

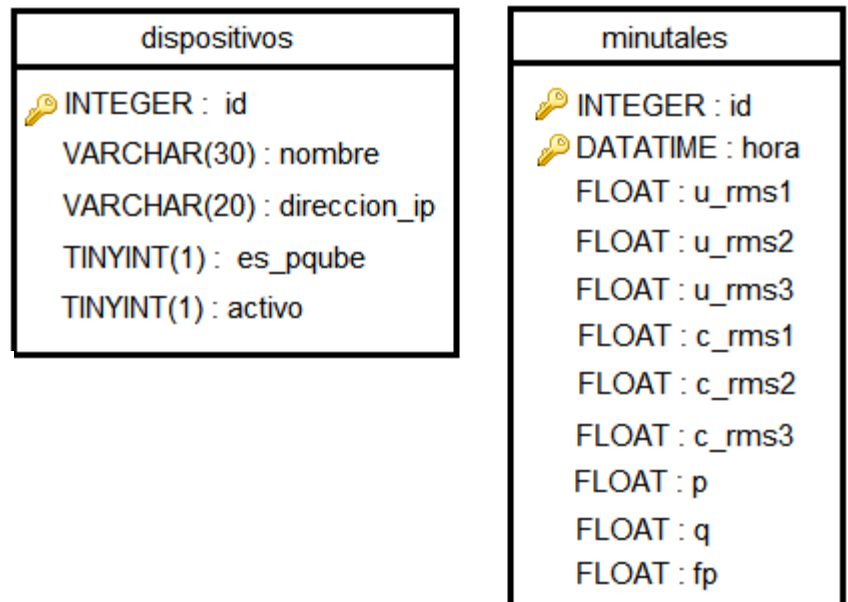


Figure 2. Schemedata 'generacion'

Other schemas are 'information_schema', 'generadores_optimagrid', 'meteorology', 'mysql', and 'pruebas'.



BBDD of INYCOM:

- Server: MySQL
- Database size: 9700 mega bytes.
- Database private / public address: 192.168.11.100.
- Host: 212.75.172.100
- User: aire
- Pass: aire
- schemas:
 - 'consumos': consumptions.
 - 'agregados': production of aero ENERCON
(`minutales' table with id=3),
production of aero SOLAR
(`minutales' table with id=5),
production of aero VESTAS
(`minutales' table with id=1).

In the documents sent me at start, there were the following information about the BBDD of INYCOM.

"We are using to the production:

- Server MySQL.
- Database size: 9700 mega bytes.
- Database private / public address: 192.168.11.100. No utilizamos acceso externo.
- Schema: vda
- Tables: paquetes.
- User: aire.
- Admin: root."

C. GUI

1. GUI (Main GUI)

There are two projects with the same agents; one is in the host PLATON, and the other is in the host OSCAR. Although they can have differences, and one could be more completed than the other.

In the document attached called *System RECOC – Agents* are a description about agents that enable to show the graphic interface to the consumptions and the productions of the Database. That is, the agents those show the information about the Database ‘consumos’ and the Database ‘generacion’. The GUI project is called *OptimagridSMA_Full*.

The following figures show the GUIs in a specific moment.

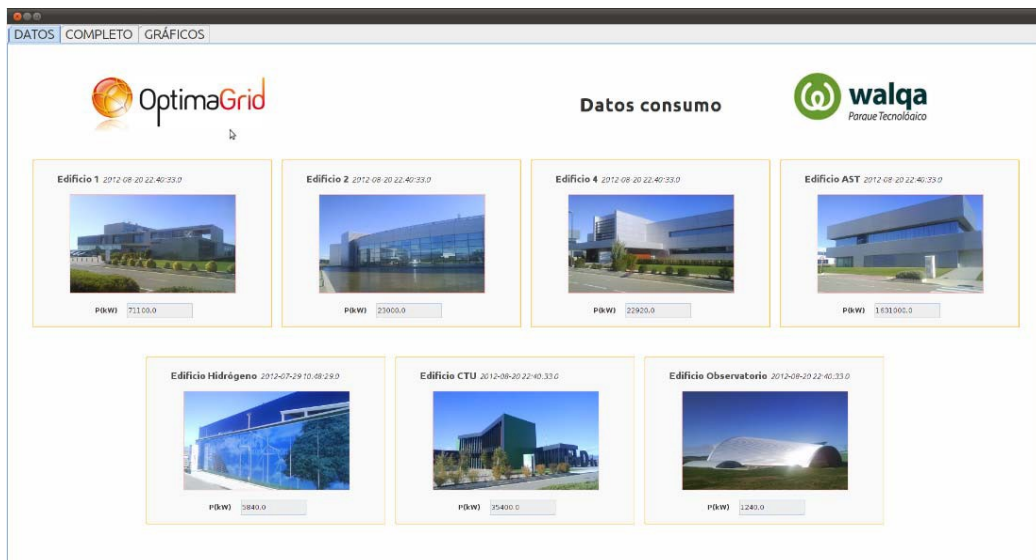


Figure 4. Data of the database ‘consumos’

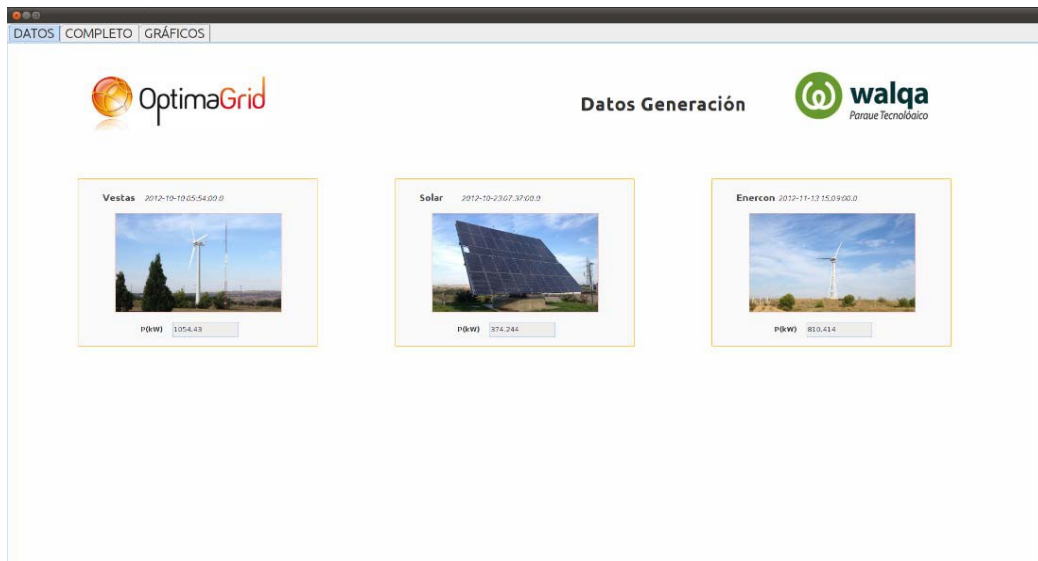


Figure 5. Data of the database 'generacion'

When we click in the different tags of the menu, we can see the data and the graphics of the Database organised in function of the buildings.

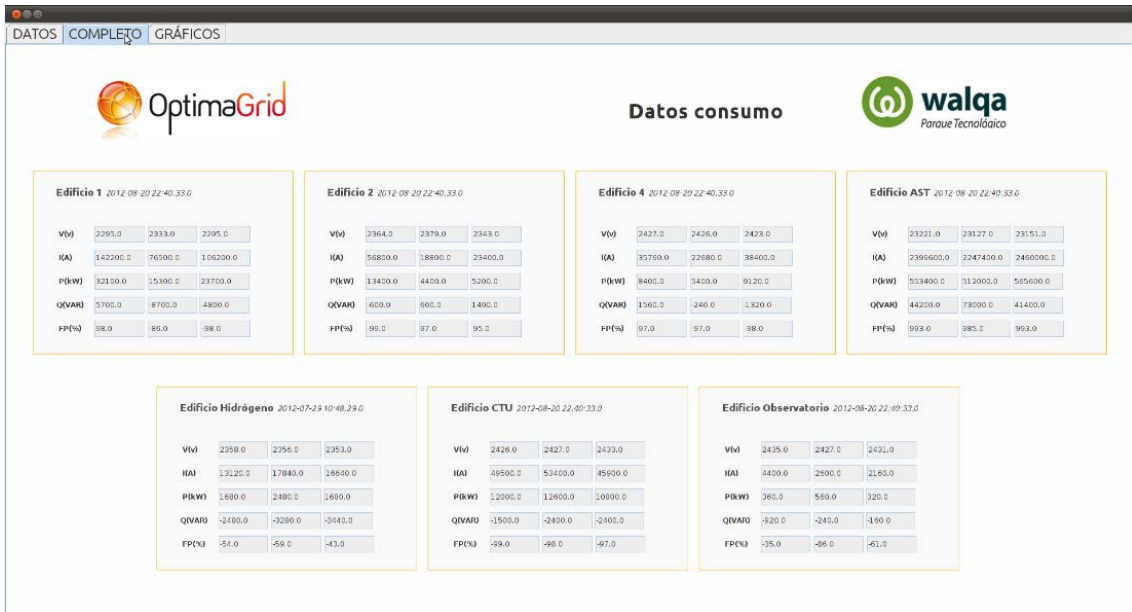


Figure 6. Complete information about the database 'consumos'

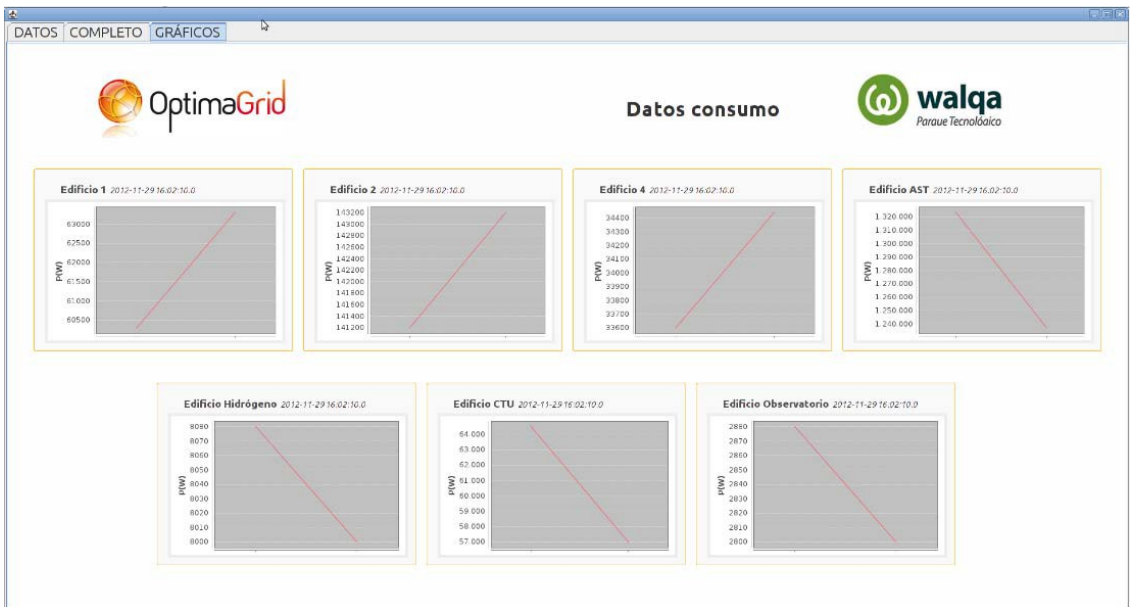


Figure 7. Graphics about the data of the database 'consumos'

The complete information about the GUI agents is developed in the document 'System RECOC – Agents' that is attached to this manual.

2. ClusterPreprocessor

The project that shows the GUI to the cluster pre-processor is kept in the host Oscar, in addition, it was implemented in the IDE Eclipse.

Next, there are several captures of the GUI created in this project:

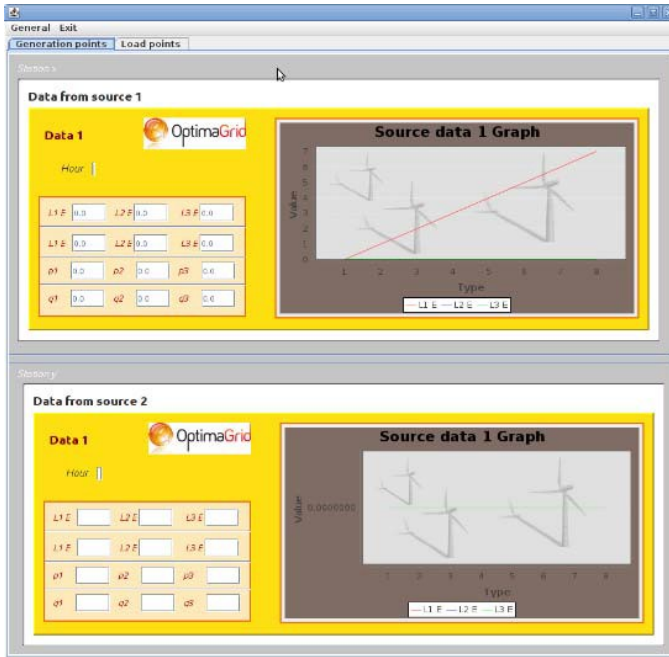


Figure 8. Generation points

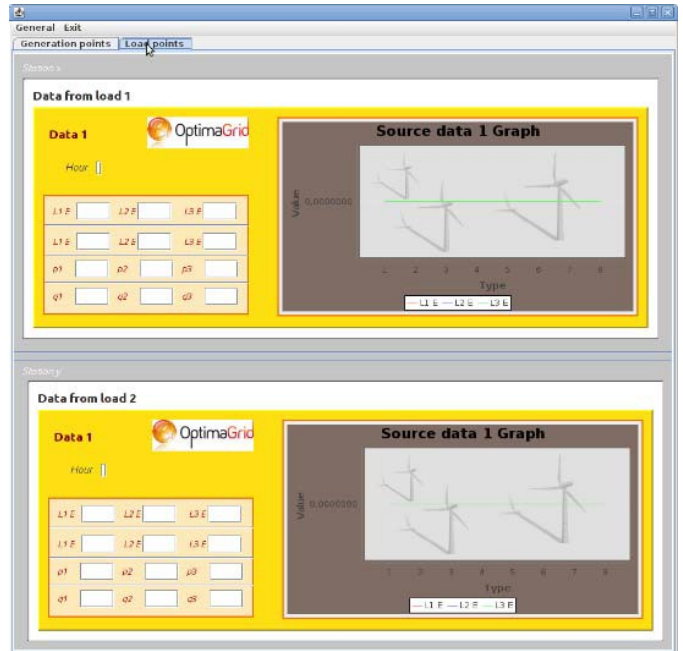


Figure 9. Load Points

3. PruebaGraficos

The GUI generated by the project PruebaGraficos only shows a graphic realised to learn use graphics in java GUIs. This project is kept in the host OSCAR, and it has been developed with Eclipse.

The result can be showed in this capture of the GUI.

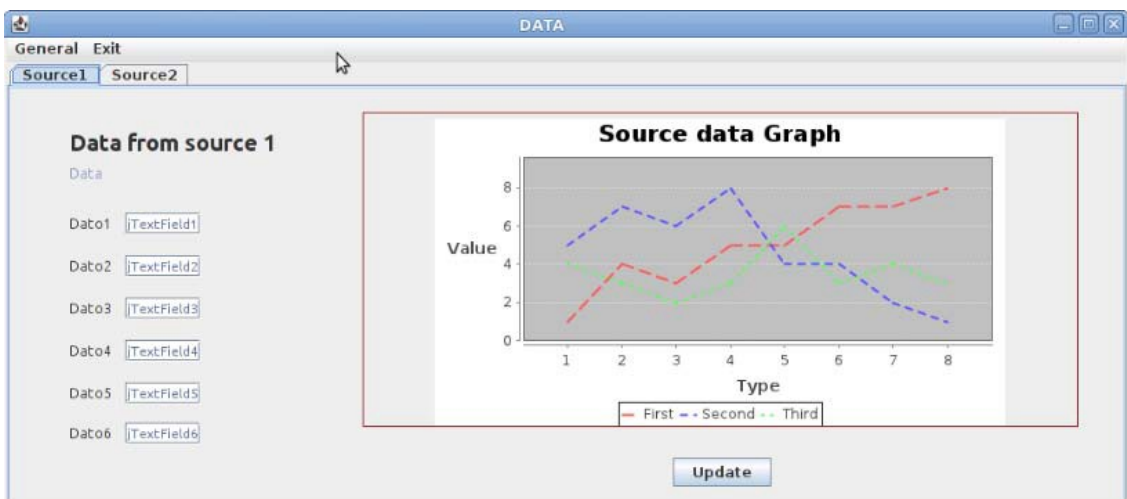


Figure 10. GUI PruebaGraficos

4. Android GUI

There are several projects in the host OSCAR and implement in the IDE Eclipse that develop a GUI to represent an android GUI with a multiagent system.

The following figure is the capture of this GUI when we start to run these projects.

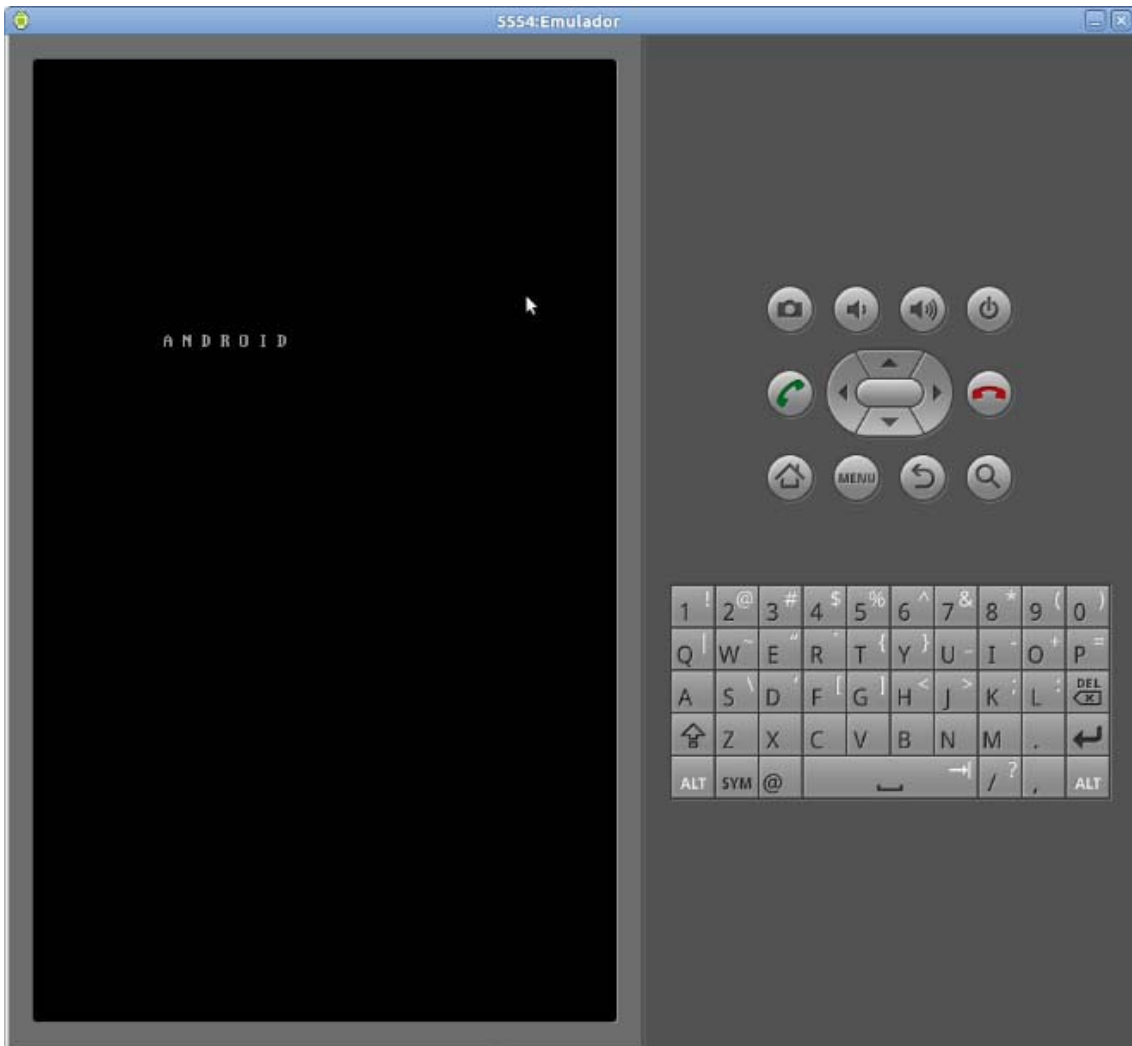


Figure 11. Android GUI



5. SCADA

Access:

<http://213.98.14.77:90>

Host: 213.98.14.77

Port: 90

Option: optimagrid-v6

Users:





User: optimagrid

Pass: optimagrid

Attached to this document, there is a user's manual to SCADA.

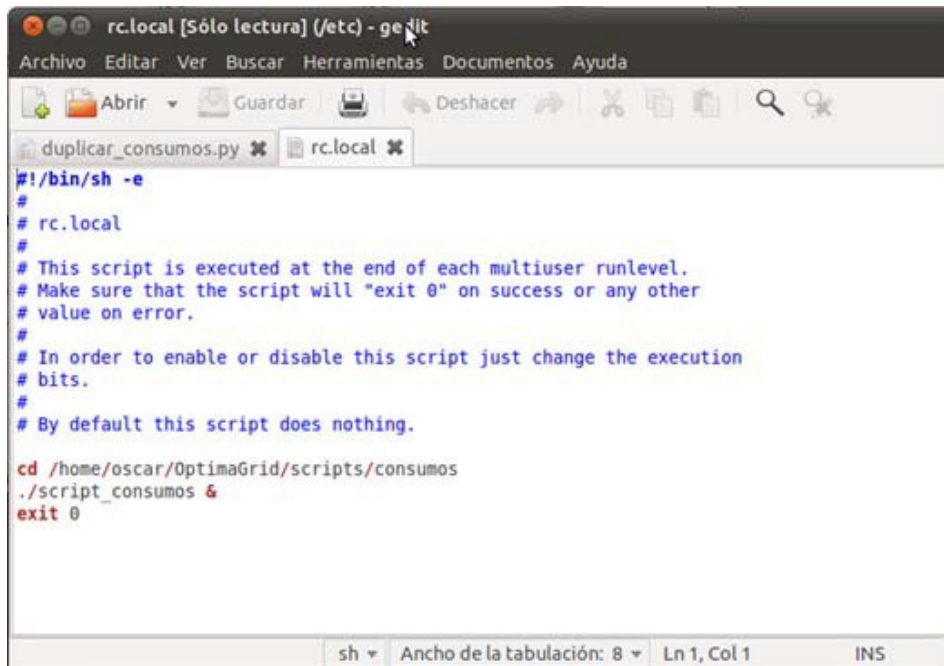
6. SCRIPTS

In the path of the host PLATON `/home/oscar/OptimaGrid/scripts`, we can find three folders with the scripts ordered by their functions:

- | | | |
|--|---|---|
| 
consumos | } | <ul style="list-style-type: none"> - <code>'script_consumos'</code>: its purpose is to run other script called <code>'duplicar_consumos.py'</code> that is written in Phyton so it need executed of a special way. - <code>'nohup.out'</code>: thanks to this file is possible to execute Phyton scripts. - <code>'duplicar_consumos.py'</code>: is the script that realizes the updating of the consumptions of our BBDD with the data of INYCOM. |
| 
meteorológicos | } | <ul style="list-style-type: none"> - <i>This folder is empty by the moment</i> |
| 
produccion | } | <ul style="list-style-type: none"> - <code>'duplicar_produccion_enercon.py'</code>: is the script that updates the productions of the aero ENERCON in our BBDD with the data of INYCOM. - <code>'duplicar_produccion_solar.py'</code>: is the script that updates the productions of the aero SOLAR in our BBDD with the data of INYCOM. - <code>'duplicar_produccion_vestas.py'</code>: is the script that updates the productions of the aero VESTAS in our BBDD with the data of INYCOM. - <code>'duplicar_produccion_solar.py_spreadsheet.py'</code>: is the script that updates the productions of the aero SOLAR in our BBDD with the data of the document Excel download of the website of the "Fundación Hidrógeno". - <code>'duplicar_produccion_vestas_spreadsheet.py'</code>: is the script that updates the productions of the aero VESTAS in our BBDD with the data of the document Excel download of the website of the "Fundación Hidrógeno". - <code>'script_produccion'</code>: its purpose is to run other scripts called (<code>'duplicar_produccion_solar.py_spreadsheet.py'</code> and <code>'duplicar_produccion_vestas_spreadsheet.py'</code>) that is written in Phyton so it need executed of a special way. |
| 
comprobaciones | } | <ul style="list-style-type: none"> - <code>'comprobar_lagunas_consumos.py'</code>: checks the intervals without data about consumptions in the Database 'consumos'. Save the intervals in a file order by intervals less than 10 seconds, between 10 seconds and 10 minutes, between 10 minutes and 1 hour, or greater than 1 hour. - <code>'comprobar_lagunas_generacion.py'</code>: checks the intervals without data about productions in the Database 'generacion'. Save the intervals with the same rules than in the previous script. - <code>'script_comprobar'</code>: lunch one of the two previous scripts. |

Updating the Database 'consumos':

When the host is connected, it call to a file called *rc.local*. The code of this script is written to execute the script '*script_consumos*'.

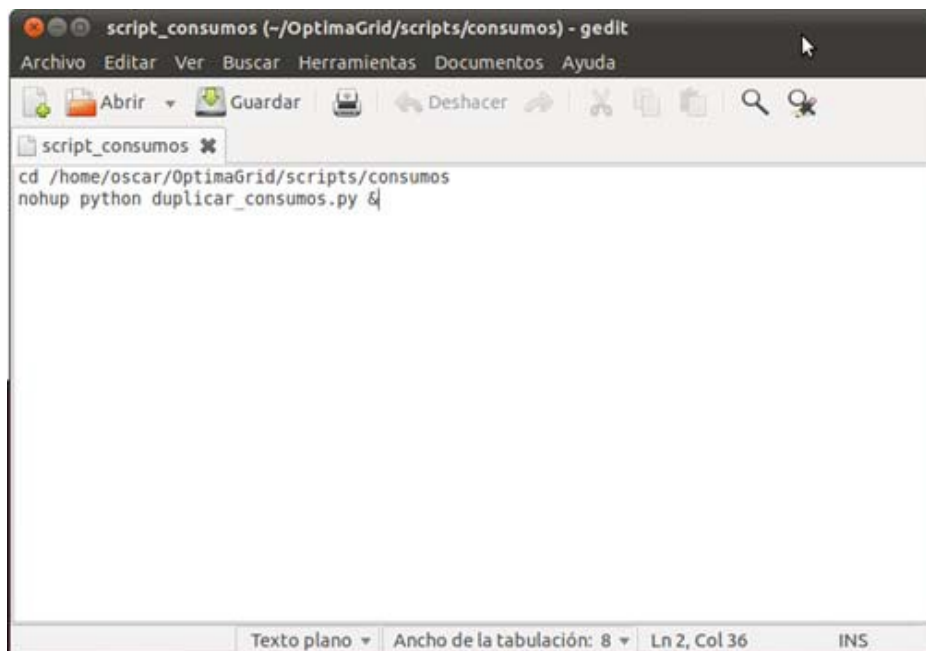


```
#!/bin/sh -e
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

cd /home/oscar/OptimaGrid/scripts/consumos
./script_consumos &
exit 0
```

Figure 12. File *rc.local*

Moreover, the script '*script_consumos*' executes the script '*duplicar_consumos.py*' that updates the database.



```
cd /home/oscar/OptimaGrid/scripts/consumos
nohup python duplicar_consumos.py &
```

Figure 13. Script '*script_consumos*'

As the script '*duplicar_consumos.py*' starts to run when the host is connected, and it needs to update the Database continuously, the script has to be run in all moment. So if we see the processes that are running in the host, we have to see the script running in the host.

To see the processes of the host, we can use the command line: *ps -f -U oscar*. Of this way we can see the processes that are running in the host and belong to the user '*oscar*', with all the information about them.

```

oscar@enrique-HP-Compaq-8100-Elite-CMT-PC: ~/OptimaGrid/scripts/consumos
Archivo  Editar  Ver  Buscar  Terminal  Ayuda
oscar 10803 10752 0 Oct29 ? 00:00:00 [zeitgeist-datat] <defunct>
oscar 10813 1 0 Oct29 ? 00:00:00 /usr/lib/gvfs/gvfsd-metadata
oscar 10816 1 0 Oct29 ? 00:00:00 /usr/lib/d-conf/dconf-service
oscar 10820 1 0 Oct29 ? 00:00:00 /usr/lib/notify-osd/notify-osd
oscar 10823 1 0 Oct29 ? 00:00:03 /usr/lib/indicator-datetime/indicator-datetime-service
oscar 10825 1 0 Oct29 ? 00:00:00 /usr/lib/indicator-session/indicator-session-service
oscar 10827 1 0 Oct29 ? 00:00:00 /usr/lib/indicator-messages/indicator-messages-service
oscar 10836 1 0 Oct29 ? 00:00:00 /usr/lib/indicator-me/indicator-me-service
oscar 10838 1 0 Oct29 ? 00:00:00 /usr/lib/indicator-sound/indicator-sound-service
oscar 10848 1 0 Oct29 ? 00:00:00 /usr/lib/indicator-application/indicator-application-service
oscar 10861 1 0 Oct29 ? 00:00:00 /usr/lib/geoclue/geoclue-master
oscar 10873 1 0 Oct29 ? 00:00:00 /usr/lib/gvfs/gvfsd-burn --spawner :1.10 /org/gtk/gvfs/exec_spaw/1
oscar 10876 1 0 Oct29 ? 00:00:10 gnome-screensaver
oscar 10888 1 0 Oct29 ? 00:00:02 /usr/lib/banfb/banfbdaemon
oscar 11139 10655 0 Oct29 ? 00:00:01 /usr/lib/gnome-disk-utility/gdu-notification-daemon
oscar 11164 10655 0 Oct29 ? 00:00:02 /usr/bin/python /usr/share/system-config-printer/applet.py
oscar 11185 10655 0 Oct29 ? 00:00:18 update-notifier
oscar 11616 1 0 Oct29 ? 00:00:00 /usr/bin/gnome-keyring-daemon --daemonize --login
oscar 22558 1 0 15:06 ? 00:00:00 /usr/bin/gnome-keyring-daemon --daemonize --login
oscar 22573 1 0 15:06 ? 00:00:09 gnome-terminal
oscar 22577 22573 0 15:06 ? 00:00:00 gnome-pty-helper
oscar 22578 22573 0 15:06 pts/1 00:00:00 bash
oscar 25467 1 3 16:23 ? 00:01:31 /usr/lib/firefox-10.0.2/firefox
oscar 25522 25467 0 16:24 ? 00:00:13 /usr/lib/firefox-10.0.2/plugin-container /usr/lib/flashplugin-installer/
oscar 25791 25593 0 Oct31 pts/0 00:00:00 su oscar
oscar 25799 25791 0 Oct31 pts/0 00:00:00 bash
oscar 26152 1 0 Nov09 ? 00:00:00 /usr/bin/gnome-keyring-daemon --daemonize --login
oscar 26317 22578 21 16:59 pts/1 00:00:32 python duplicar_consumos.py
oscar 26367 22578 0 17:01 pts/1 00:00:00 ps -f -U oscar
oscar 32839 1 0 Nov12 ? 00:00:00 /usr/bin/gnome-keyring-daemon --daemonize --login
oscar@enrique-HP-Compaq-8100-Elite-CMT-PC:~/OptimaGrid/scripts/consumos$

```

Figure 14. The script '*duplicar_consumos.py*' is running

The script '*duplicar_consumos.py*' is attached to this document to look up it.

Updating the Database 'generacion':

To update the Database it is necessary to upload the spreadsheets that contain the updating data. So we need to go at the FTP of the 'Fundación Hidrógeno' ([read the chapter that corresponds](#)), and to download the spreadsheets.



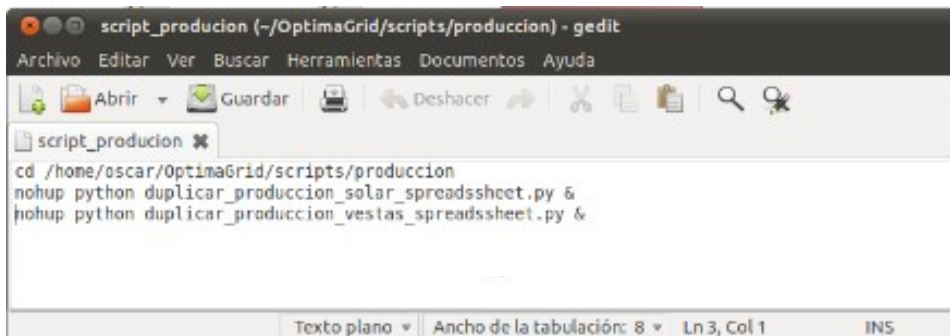
Nombre	Tamaño	Última modificación
Paquetes_solar.xlsx	10341 KB	15/11/12 09:38:00
Paquetes_vestas.xlsx	9513 KB	15/11/12 09:40:00

Figure 15. Spreadsheets in the FTP

The spreadsheets have to be kept in the directory *datos_generacion* in the path */home/oscar/OptimaGrid/datos_generacion* because the scripts will go to search the updating data to this folder.

The updating of the Database 'generacion' is realised by the script *duplicar_produccion* which calls to the scripts that update the 'Solar' productions (*duplicar_produccion_solar_spreadsheet.py*) and the 'Vestas' productions (*duplicar_produccion_vestas_spreadsheet.py*).

It is possible to see the code of the script *duplicar_produccion* in the following figure, and to look up the code of the other scripts the scripts are attached to this manual.



```

script_produccion (~/.OptimaGrid/scripts/produccion) - gedit
Archivo Editar Ver Buscar Herramientas Documentos Ayuda
Abrir Guardar Deshacer
script_produccion
cd /home/oscar/OptimaGrid/scripts/produccion
nohup python duplicar_produccion_solar_spreadsheet.py &
nohup python duplicar_produccion_vestas_spreadsheet.py &

```

Figure 16. Code of the script called script_produccion

[Note: to see in depth the development of the scripts, it is possible to look up the document *Development Scripts – Updating Database 'generacion'* attached to this manual]



The following capture shows the file 'nohup.out', the file out to the running of the script duplicar_produccion. As it is possible see, in the updating realised at November, 23 of 2012.

```
nohup.out (~/.OptimaGrid/scripts/produccion) - gedit
Archivo Editar Ver Buscar Herramientas Documentos Ayuda
nohup.out x
2012-11-23 11:24:49.473738
Ejecutada consulta ultimo dato VESTAS replicado en local: SELECT hora FROM minutales where id=1 order by hora desc limit 1;
Van a ser a añadidas 0 nuevas producciones.
Documento excel con cerrado, recursos liberados.
Conexion con BBDD local OptimaGrid(RECOC) cerrada.
Fecha: 2012-11-23 11:24:49.473738

2012-11-23 11:24:49.470364
Ejecutada consulta ultimo dato SOLAR replicado en local: SELECT hora FROM minutales where id=5 order by hora desc limit 1;
Van a ser a añadidas 0 nuevas producciones.
Documento excel con cerrado, recursos liberados.
Conexion con BBDD local OptimaGrid(RECOC) cerrada.
Fecha: 2012-11-23 11:24:49.470364

Texto plano Ancho de la tabulación: 8 Ln 1, Col 1 INS
```

Figure 17. Out file, 'nohup.out'



7. FUNDACIÓN DE HIDRÓGENO

It provides the data to update the Database 'generacion' through an FTP.

FTP address: <ftp://194.140.155.97>

or <ftp2.hidrogenoaragon.org>

Username: usuario_optimagrid

Password: 7?Duk@



8. WEB OPTIMA GRID

=====

EN HOST optiweb

=====

IP interna: 172.16.9.61

IP externa: 193.146.136.159

acceso ssh:

user: dchinarro

pass: 85murESa

shel para privilegios admin: sudo

raiz web en /var/www

Mysql

user:??????????????

pass:??????????????

Tomcat en :8080/manager/html,

Usuario: tomgrid

Passw: f7WRuh7c

/opt/tomcat

Mysql.

User:root

Pass:FAch3he3

root del Apache:

var/www/index.html

Acceso a gestión desde Tomcat:

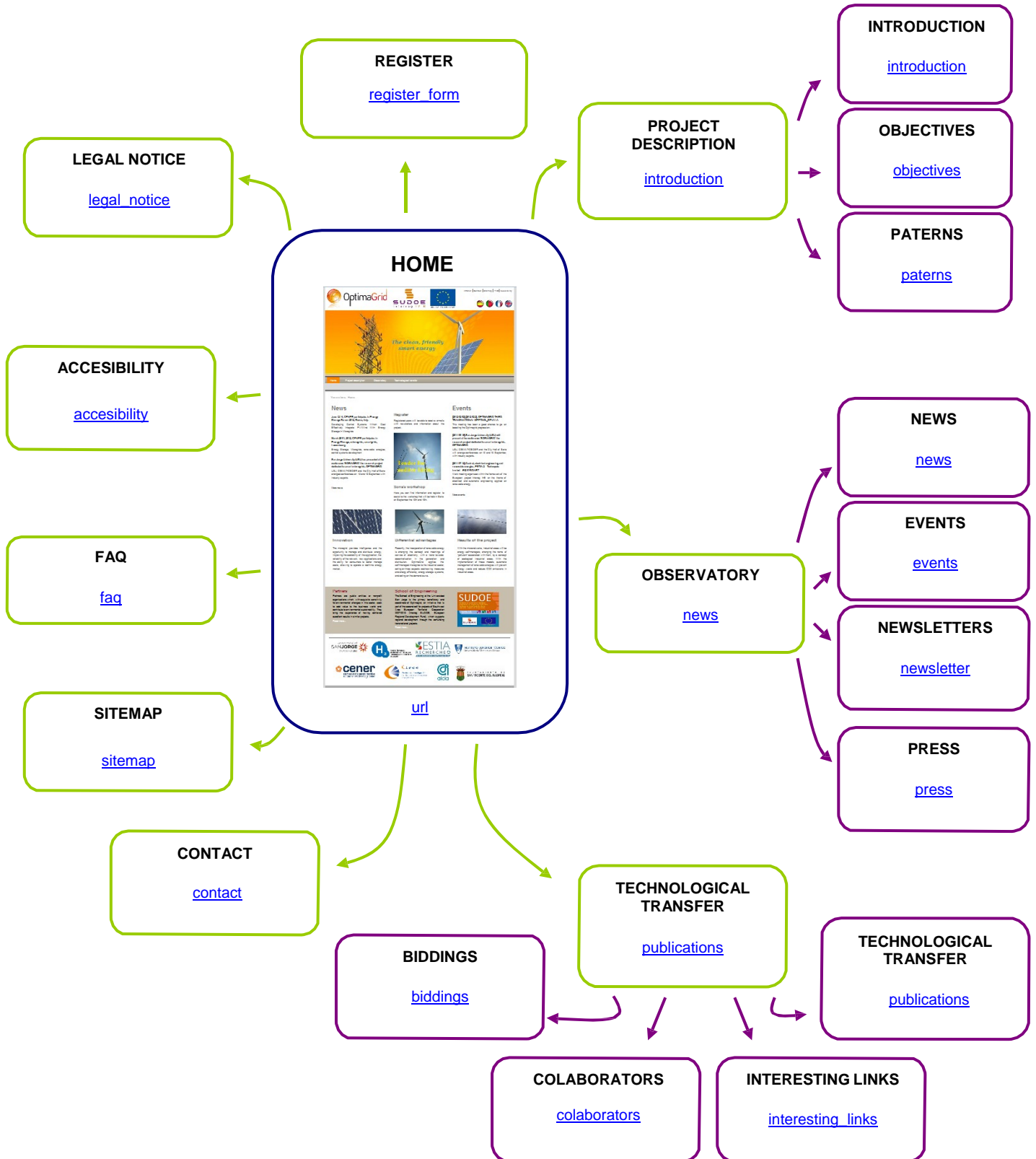
<http://optimagrid.eu:81/gestor/hello.jsp>

Acceso a la web www.optimagrid.eu/administracion para administrar contenidos

Usuario: sanjorge

Contraseña: ioH)lm\$3

SITEMAP:





9. GOOGLE ACCESS

Gmail account:

Gmail: OptimaGridProject@gmail.com

Password: optima_recoc

Analytics account:

Google Analytics (GA): is one of the services offered by Google. The visits to our website can be supervised, and detailed statistics about these visits are generated through this service.

User: OptimaGridProject@gmail.com

Password: optima_recoc



10. MODDLE OPTIMA GRID

This chapter has the objective to give a general idea of the actual situation of the Moodle of OPTIMAGRID, in addition to provide information about its access, organisation, and main features of the Moodle.

SERVER

```
=====
HOST: optimod.
=====
Aplicación Moodle:
IP interna 172.16.9.38
IP externa: 193.146.136.158
Usuario :admin
Password: weGx_d5N

acceso ssh:
            user: ???????????
            pass: ???????????

MOODLE doc.optimagrid.es

cgonzalo
opti2011-GRID

dchinarro
opti2011-GRID

SOE2/P2/E322

opti-5GRID
```

Moreover, according to the Moodle information about the Server, the session time out is of two hours, after this time, if the user is inactive yet, the session will finish.

ACCOUNT OF USERS

At 29/10/2012, there are 25 accounts of users that can have different roles in function of their papers in the system.

Kind of roles:

- ▮ Administrator: normally, administrators can do anything in the Moodle, in any course.
- ▮ GT Manager: can take any action and activity within a course.
- ▮ GT Partner:
- ▮ Assistant: has less privileges than GT Contributor
- ▮ Guest: has the minimum privileges
- ▮ Usuario autenticado: all authenticated users.

The roles can be global or they can depend of a part of Moodle: courses, title page...

COURSES

In this moment, there are six courses in the category 'OPTIMAGRID development', one in the category 'EVENTS', and five in the category 'Projects for OPTIMAGRID'.

Categorías: OPTIMAGRID development

Editar esta categoría Agregar una sub-categoría

Cursos	Editar	Seleccionar
OPTIMAGRID.GT1-Coordination and project management	🔍 ✖ 🗑 ⚙ ⬇	<input type="checkbox"/>
OPTIMAGRID.GT2-Definition and modeling of Microgrid	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
OPTIMAGRID.GT3-Micro-grid Implementation	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
OPTIMAGRID.GT4-Design, development and implementation of the central control system	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
OPTIMAGRID.GT5.-Monitoring and evaluation	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
OPTIMAGRID.GT6-Advertising, information and capitalization	🔍 ✖ 🗑 ⚙ ⬆	<input type="checkbox"/>

Mover los cursos seleccionados a...

Figure 18. Courses in the category OPTIMAGRID development

Categorías: EVENTS

Editar esta categoría Agregar una sub-categoría

Cursos	Editar	Seleccionar
SORIAGRID	🔍 ✖ 🗑 ⚙	<input type="checkbox"/>

Mover los cursos seleccionados a...

Figure 19. Course in the category EVENTS

Categorías: Student projects for OPTIMAGRID

Editar esta categoría Agregar una sub-categoría

Cursos	Editar	Seleccionar
PFG_Sergio_Javierre	🔍 ✖ 🗑 ⚙ ⬇	<input type="checkbox"/>
PFG_of_FernandoFORNIES	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
PFG_of_VFRISACH	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
PFM_of_JorgeSICILIA	🔍 ✖ 🗑 ⚙ ⬆ ⬇	<input type="checkbox"/>
RURALGRID. Management	🔍 ✖ 🗑 ⚙ ⬆	<input type="checkbox"/>

Mover los cursos seleccionados a...

Figure 20. Courses in the category Projects for OPTIMAGRID

For each course, the users can have a specific role. Depending of the course and the part that is need by the person to his work, the user can has a specific kind of role to that course. Of this way a user that is *GT Partner* can be *Administrator* to a specific course.

GRADES

In this moment the Moodle is configured to shows in the grades book the users with roles of *Administrador* and *Asistente*. The navigated method is through a drop-down menu, and the grades are showed as a percentage with two decimals.

IDIOM

The default idiom is the English, although the actual idiom in the Moodle is the Spanish.



ACTIVITIES

The available activities are chats, consultations, questionnaires, labels, forums, glossaries, resources, and wikis. Now, the visible courses are Administration, Administration of the site, Calendar, Courses, Description Course/Site, Entry, HTML, Marks of the Administrator, Marks, Messages, Main Menu, News, People, Online Users.

SECURITY

The security is configured to not send notifications when there is a fail access.

APPEARANCE

The theme that is selected is the *standardgreen*. Other feature of this section that can be interesting is the maximum number of courses; the established value at this moment is 21 courses as maximum.

For other hand, there are two marks named '*Pervasive computing*' and '*Mathematic Model by Wavelets*'.

TITLE PAGE

The actual name of the site is "*OPTIMAGRID PROJECT REPOSITORY*", and in the title page shows a list of 20 courses per page. As it was mentioned previously, the users can be local roles to the title page; in this moment there are two persons that have local administrator role.

NETWORK

Nowadays, the network is disabled.

REPORTS

The reports of the Moodle show that there are some warnings and a critical error in the *default roles (course)*.



Task Force: GT4	Design, development and implementation of <i>Renewable Energy Consumption Optimization Center (RECOC)</i>
Deliverable: D19b	Technical Guides
Authors	David Chinarro, Ana Marcén

SYSTEM RECOC - AGENTS



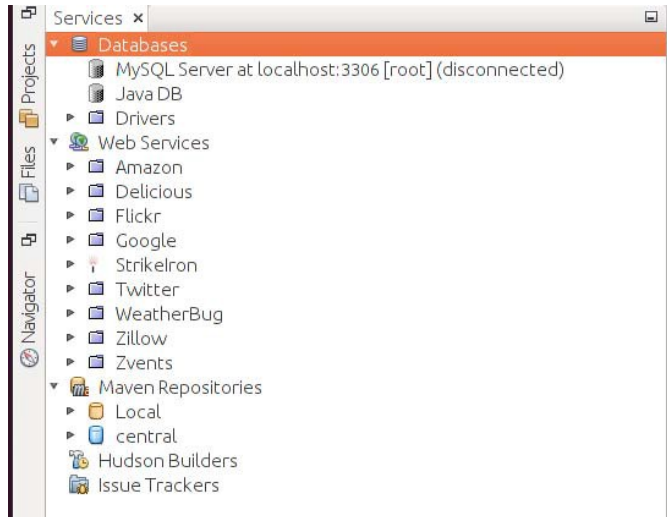
INDEX

Pages

OptimagridSMA_Full	3
Services	3
Agents	3
A. Agent.Cluster	5
B. Agent.Cluster.HandlerAgent	5
C. Agent.Cluster.Painter	6
D. Agent.Huddle	6
E. Agent.Huddle.Handler	7
F. Agent.Huddle.Painter	7
G. Agent.Load	8
H. Agent.Source	8
SerialPortDisplayApp	9
interfaz_CEM	9
ClusterPreprocessor	9
Android_Agents	9
RemoteControllerAndroid	9

OptimagridSMA_Full

Services



The services window shows that important resources are registered with the IDE Netbeans in the host Igniton-MAS.

Figure 1. Services windows

Agents

The projects window shows the projects that are implemented in the IDE. In IDE Netbeans of the host Igniton-MAS, there is only one project with several packages. In the following sections these packages are discomposed in order to describe their agents and the behaviours of the agents.

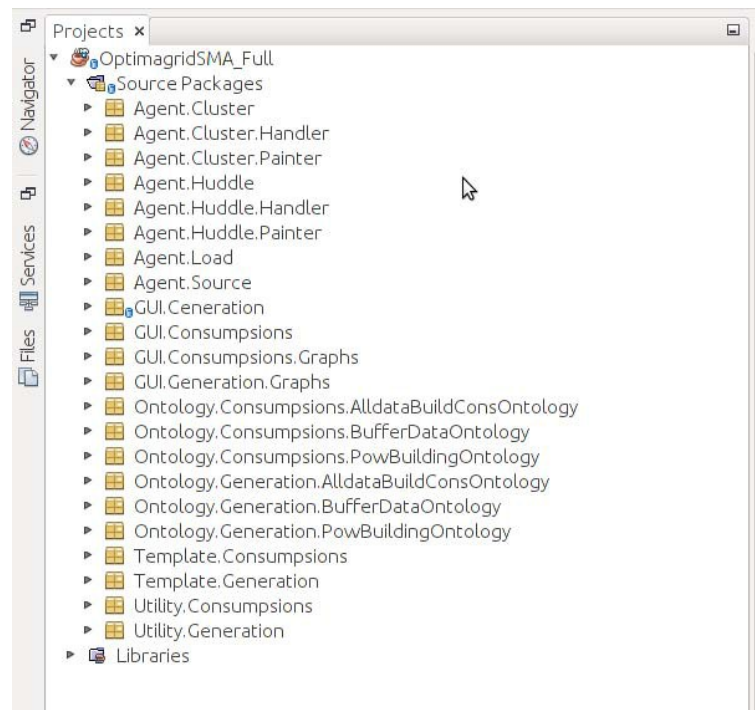


Figure 2. Projects windows



To execute this project is used the following line of arguments:

```
-gui -local-host localhost -agents
    cluster:Agent.Cluster.ClusterPrepAgent;
    huddle:Agent.Huddle.HuddlePrepAgent;
    sourceVestas:Agent.Source.SourceGenerationBuildingAgent;
    sourceEnercon:Agent.Source.SourceGenerationBuildingAgent;
    sourceSolar:Agent.Source.SourceGenerationBuildingAgent;
    load1:Agent.Load.LoadConsumptionBuildingAgent;
    load2:Agent.Load.LoadConsumptionBuildingAgent;
    load4:Agent.Load.LoadConsumptionBuildingAgent;
    loadAST:Agent.Load.LoadConsumptionBuildingAgent;
    loadHid:Agent.Load.LoadConsumptionBuildingAgent;
    loadCTU:Agent.Load.LoadConsumptionBuildingAgent;
    loadObs:Agent.Load.LoadConsumptionBuildingAgent;
    generationPainter:Agent.Cluster.Painter.DataSourcePainterAgent;
    consumpsionsPainter:Agent.Huddle.Painter.DataLoadPainterAgent

-services
jade.core.event.NotificationService;jade.core.messaging.TopicManagementService
```

Thanks to these arguments the project when is launched create all the agents and services required by the arguments, and in time of execution show the GUIs that show the data of the Databases 'consumos' and 'generacion'

For other hand, we can study in depth the agents of this project taking into account the PCF of Óscar.

In the PCF of Óscar, he wrote that the Project has to have the following agents in function of the Hosts/Devices

Hosts/Devices	Agents
Generator Server G1.	<ul style="list-style-type: none"> - Source Agent. - Cluster Preprocessor Agent. - Auction Agent.
Load Server L1.	<ul style="list-style-type: none"> - Load Agent. - Huddle Preprocessor Agent.
Manager Server.	<ul style="list-style-type: none"> - Wavelet Neuronal.
Public server.	<ul style="list-style-type: none"> - Client Agents. - Circuit Agents.
Painter.	<ul style="list-style-type: none"> - Display agents.



Taking this table as a general idea of agents, it is possible to do a comparison between it and the following agents that are implemented in the IDE Netbeans of the host Ignition-MAS:

A. Agent.Cluster

It is a package with the agent ClusterPrepAgent.

Agent Name	Cluster Preprocessor Agent						
Class Name in the IDE	ClusterPrepAgent						
Description of the agent	<p>If it receives the next parameters:</p> <ul style="list-style-type: none"> - AID of agent, so it must reply - Ontology, so it must use <p>In order to realise the previous tasks, it has the following behaviours:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Behaviour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>TickerBehaviour</td> <td>It sends periodically a message about topic "generation_data"</td> </tr> <tr> <td>CyclicBehaviour</td> <td>It waits for messages with pow data of the different source agents.</td> </tr> </tbody> </table>	Behaviour	Description	TickerBehaviour	It sends periodically a message about topic "generation_data"	CyclicBehaviour	It waits for messages with pow data of the different source agents.
Behaviour	Description						
TickerBehaviour	It sends periodically a message about topic "generation_data"						
CyclicBehaviour	It waits for messages with pow data of the different source agents.						

B. Agent.Cluster.HandlerAgent

It is a package with the agent MySQLHandlerAgent.

Agent Name					
Class Name in the IDE	MySQLHandlerAgen				
Description of the agent	<p>For a specific handler, it sends a message with the generation_data information acquired in the BBDD.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Behaviour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OneShotBehaviour</td> <td>It sends the message</td> </tr> </tbody> </table>	Behaviour	Description	OneShotBehaviour	It sends the message
Behaviour	Description				
OneShotBehaviour	It sends the message				



C. Agent.Cluster.Painter

It is a package with the agent DataSourcePainterAgent

Agent Name	DisplayAgents	
Class Name in the IDE	DataSourcePainterAgent	
Description of the agent	It shows a GUI that shows the consumptions.	
	Behaviour	Description
	TickerBehaviour	Request data building and consumptions
	CyclicBehaviour	Wait for messages

D. Agent.Huddle

It is a package with the agent DataSourcePainterAgent

Agent Name	Huddle Preprocessor Agent	
Class Name in the IDE	DataSourcePainterAgent	
Description of the agent	If it receives the next parameters:	
	<ul style="list-style-type: none"> - AID of agent, so it must reply - Ontology, so it must use 	
	Behaviour	Description
	TickerBehaviour	Sends periodically a message about topic "load_data"
CyclicBehaviour	Wait for messages	



E. Agent.Huddle.Handler

It is a package with the agent MySQLHandlerAgent.

Agent Name					
Class Name in the IDE	MySQLHandlerAgent				
Description of the agent	<p>For a handler associated to the agent, it sends a message with information (It seems to have a problem because the information asked to the BBDD doesn't appear).</p> <table border="1"> <thead> <tr> <th>Behaviour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OneShotBehaviour</td> <td>It sends the message</td> </tr> </tbody> </table>	Behaviour	Description	OneShotBehaviour	It sends the message
Behaviour	Description				
OneShotBehaviour	It sends the message				

F. Agent.Huddle.Painter

It is a package with the agent MySQLHandlerAgent.

Agent Name							
Class Name in the IDE	DataLoadPainterAgent						
Description of the agent	<p>It shows a GUI that shows the consumptions or generations ???</p> <table border="1"> <thead> <tr> <th>Behaviour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>TickerBehaviour</td> <td>Request data building and consumptions</td> </tr> <tr> <td>CyclicBehaviour</td> <td>Wait for messages</td> </tr> </tbody> </table>	Behaviour	Description	TickerBehaviour	Request data building and consumptions	CyclicBehaviour	Wait for messages
Behaviour	Description						
TickerBehaviour	Request data building and consumptions						
CyclicBehaviour	Wait for messages						



G. Agent.Load

It is a package with the agent LoadConsumtionBuildingAgent.

Agent Name							
Class Name in the IDE	LoadConsumtionBuildingAgent						
Description of the agent	<p>It is a load building agent, it creates a specific kind handler depending of the place where the required data is, and it obtains the building data.</p> <table border="1"> <thead> <tr> <th>Behaviour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>TickerBehaviour</td> <td>Request the data to the associated building periodically.</td> </tr> <tr> <td>CyclicBehaviour</td> <td>Wait for messages</td> </tr> </tbody> </table>	Behaviour	Description	TickerBehaviour	Request the data to the associated building periodically.	CyclicBehaviour	Wait for messages
Behaviour	Description						
TickerBehaviour	Request the data to the associated building periodically.						
CyclicBehaviour	Wait for messages						

H. Agent.Source

It is a package with the agent SourceGenerationBuildingAgent.

Hosts/Devices	Agents
Generator Server G1.	<ul style="list-style-type: none"> - Source Agent. - Cluster Preprocessor Agent. - Auction Agent.
Load Server L1.	<ul style="list-style-type: none"> - Load Agent. - Huddle Preprocessor Agent.
Manager Server.	<ul style="list-style-type: none"> - Wavelet Neuronal.
Public server.	<ul style="list-style-type: none"> - Client Agents. - Circuit Agents.
Painter.	<ul style="list-style-type: none"> - Display agents.



Other projects that could belong to the System RECOC: [It is necessary to know them to know if they belong to the system RECOC]

SerialPortDisplayApp

interfaz_CEM

ClusterPreprocessor

Android_Agents

RemoteControllerAndroid



Task Force: GT4	Design, development and implementation of <i>Renewable Energy Consumption Optimization Center</i> (RECOC)
Deliverable: D19c	Technical Guides

SCADA version manual



ABSTRACT

In this manual the reader can find the present state of the SCADA that is currently under development in the Optimagrid project. This paper aims to be a useful guide for all those who want to run the SCADA and check its functionalities. The reader will find a route through the different sections composing the program, as well as a number of observations about some of the pictures describing the most relevant screens of the application.

CONTENTS

1	Requirements, download and execution of the program	4
2	Main screen	6
3	Production screen.....	7
4	Consumption screen.....	9
5	Wind and radiation screen	11
6	History screen	12
7	Comparatives screen	15
8	References	16

1 REQUIREMENTS, DOWNLOAD AND EXECUTION OF THE PROGRAM

In order to execute the SCADA we only need a computer with an Internet browser (such as Internet Explorer, Chrome, Mozilla Firefox, etc.) and an installed Java Virtual Machine (the last version of this software can be downloaded from <http://java.com/en/download>). A version of the SCADA for mobile phones is also under development.

Once we fulfill these requirements, we can open the following URL with our browser: <http://213.98.14.77:90>. Here we will find a page that welcomes us and, under that section, another one called “Launch projects”. Here we must look for the project “Optimagridv5” (the fifth version of the SCADA), and click in the “Launch” button to the right. It will download a launcher to our computer.

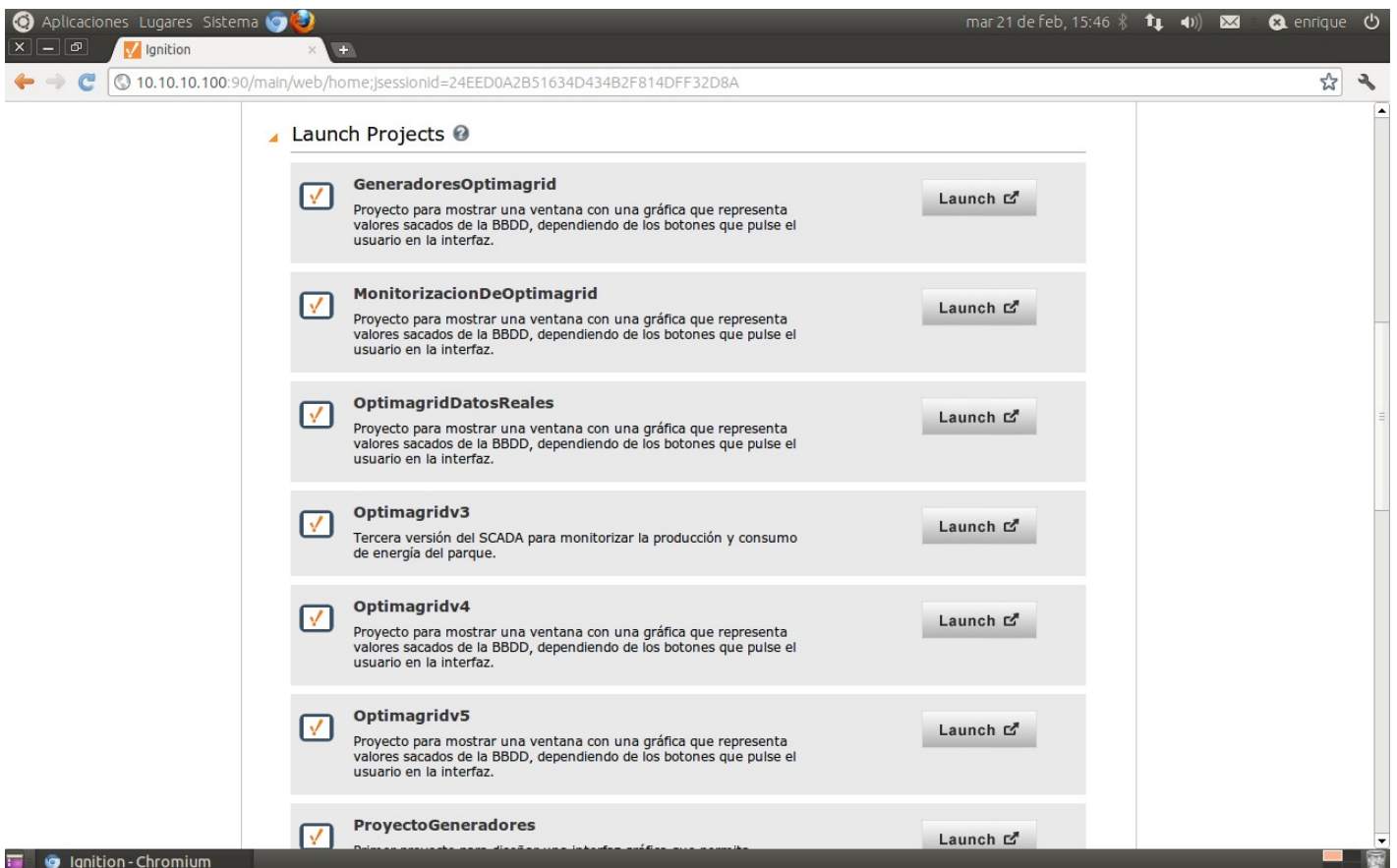


Fig. 1 – Section for launching projects in the web.

The next step is to execute that launcher. The Java Virtual Machine should execute it by simply double-clicking on it. If it does not, right-click on it, and choose the option “Open with...” the Java Virtual Machine.

Once the launcher is executed, it will download the project (it will take some seconds) and prompt the login screen. Here we will find a brief description of the project and will be asked for our username and password. Both of them are “optimagrid”. Clicking on the “Login” button will take us to the main screen of the SCADA.

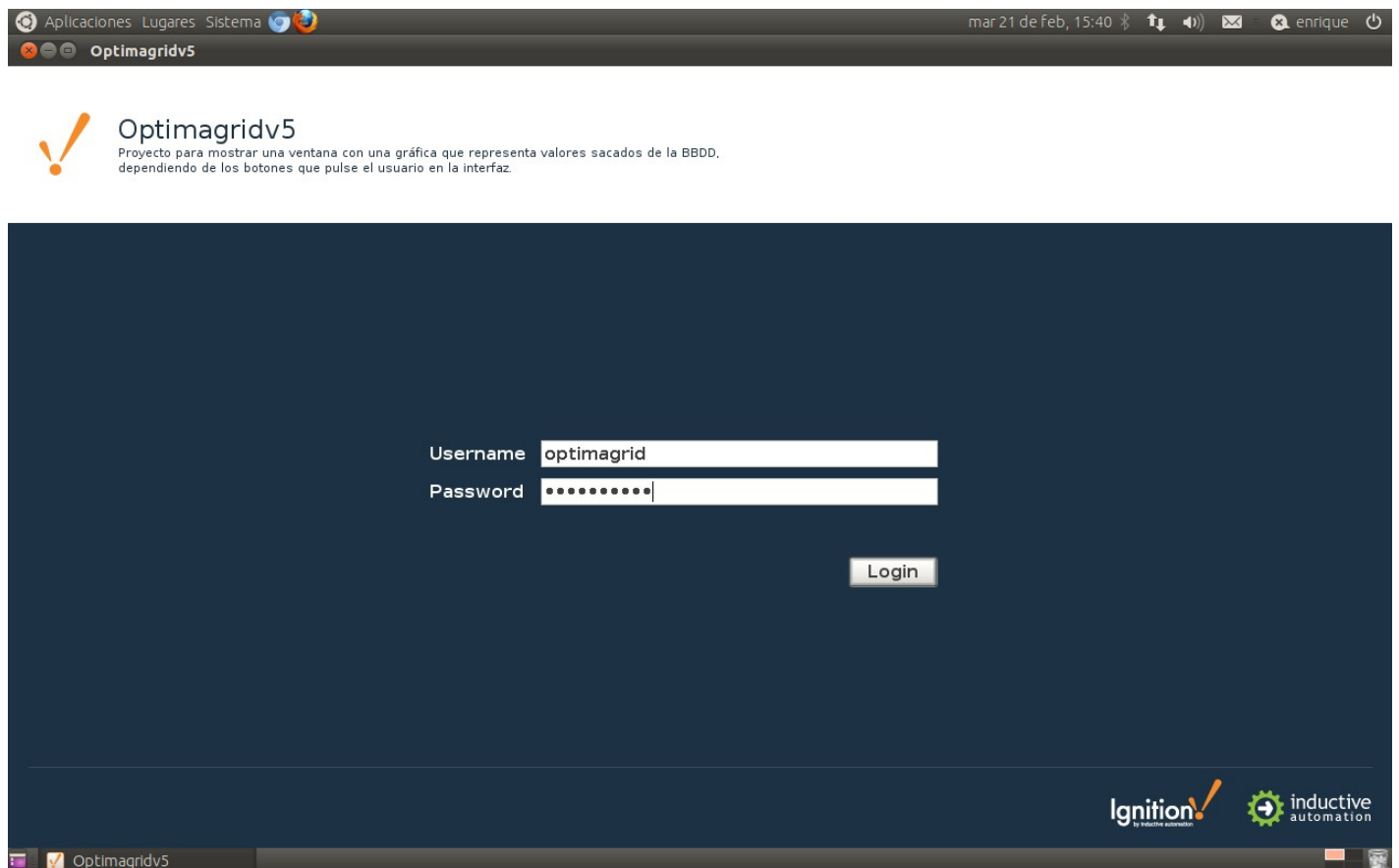


Fig. 2 – Login screen.

2 MAIN SCREEN

The screens are divided in three parts: In the upper left we have three menus with different options (this is predefined by the Ignition software), below that we have the five tabs (we use them to navigate through the screens of the SCADA) and below these we have the current, selected screen.

The first time we enter the SCADA, none of the tabs are selected and we are presented a big picture with the declaration “The clean, friendly smart energy”, and below that we can see the logo of the project (which is included in every screen to the right of the tabs). Clicking on the picture or any of the logos will open the project’s main page (<http://optimagrid.eu>) in your Internet browser.



Fig. 3 – The first screen of the SCADA.

The predefined options in the upper left part of the screen are “Command”, “Windows” and “Help”. In “Command” we can find “Logout” (it will logout our session in the SCADA, taking us back to the login page), “Lock Screen” (it will lock the screen of the SCADA, just like the screensaver in the operating system, with the password we entered in the session) and “Exit” (it will finish the program). In “Windows” we can choose a window of the SCADA in order to close it (here “window” refers to the tabs section and the screen below them). Finally, “Help” can show us a diagnostics console with technical parameters about the application we are executing, or information about the Ignition Vision client we are currently using in the SCADA.

3 PRODUCTION SCREEN

If we click on the “Production” tab in the tabs menu we will see the main screen of this section. There are pictures of the generators monitored by the SCADA (actually four, in the Walqa technological park) and below them the buttons with their names. If we click on any of these buttons the SCADA will open a window with a bar graphic representing the average power production (active or reactive) in the period of time we choose (the last day, week, month or year).

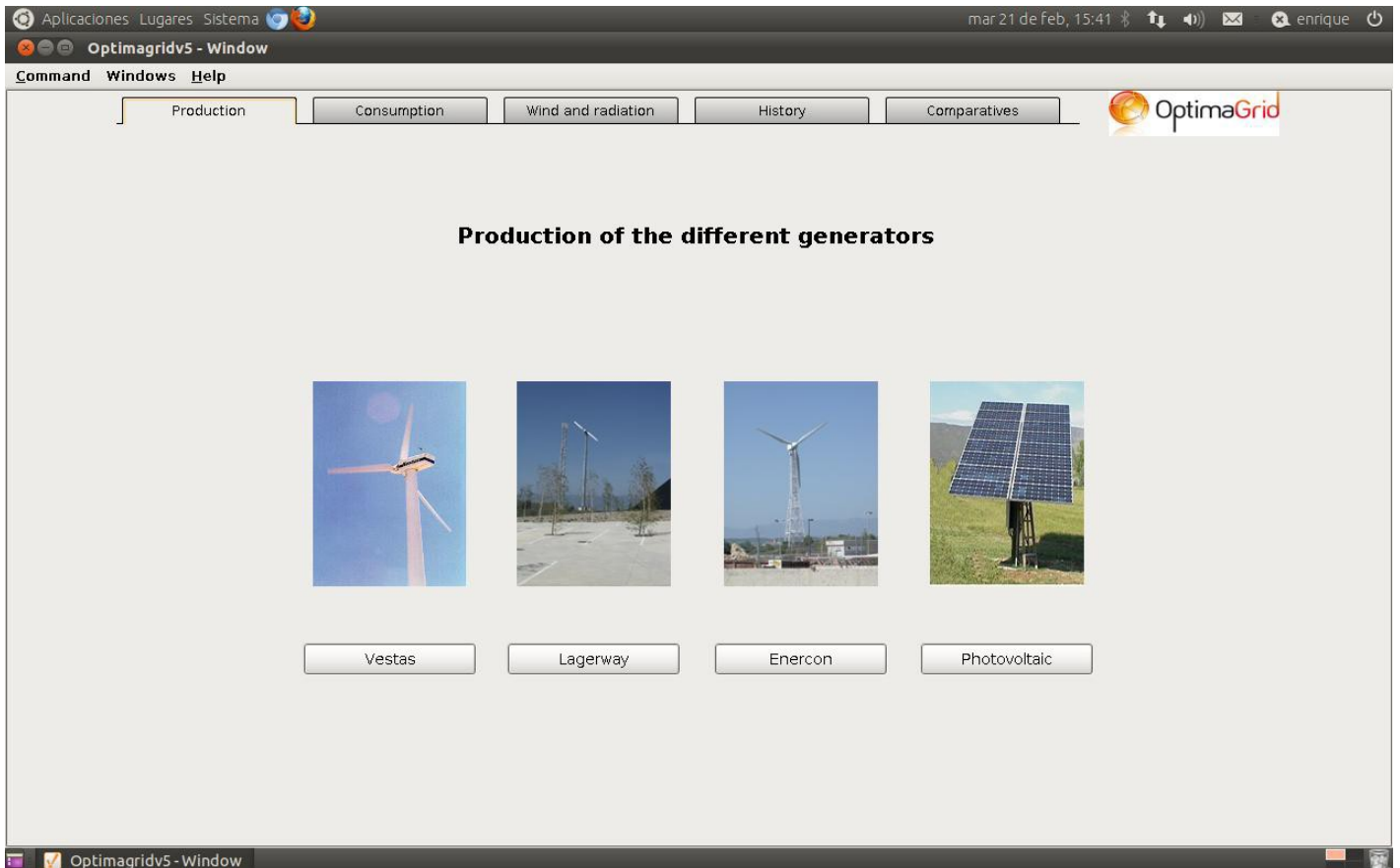


Fig. 4 – The production screen.

The magnitude and the period of time we want to see are controlled by the buttons below. By default, none of them are selected (so the graphic is empty the first time we open the window). Once we do our choice it will take some seconds to refresh the graphic, but we will see the three power phases and the total.

One clarification here is that, by now, we will only see something if we pick “Last year” in the Lagerway or Enercon generators. The reason for this is that actually the measuring devices are not operational, although they should be ready soon.

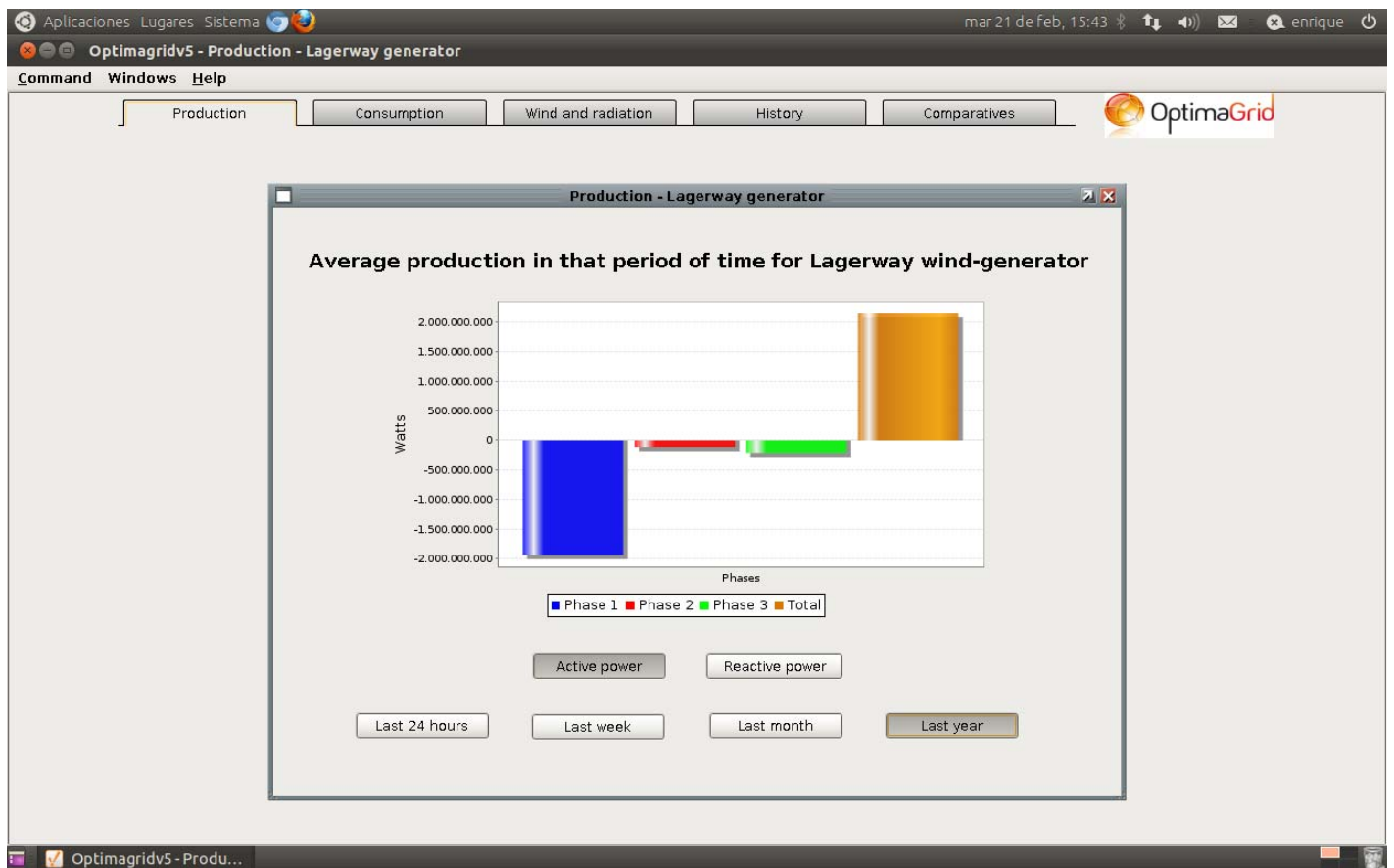


Fig. 5 – Window with data about power production of one of the generators.

4 CONSUMPTION SCREEN

Just like “Production” screen, but showing the different buildings monitored by the SCADA. In this case, they are seven and all of them are in the Walqa technological park. If we click on any of the buttons below their pictures, the SCADA will show another window with a graphic bar representing the average of the selected magnitude in the selected period of time. In this case we can choose between voltage, intensity, active or reactive power and power factor (although probably the most interesting are both active and reactive power).

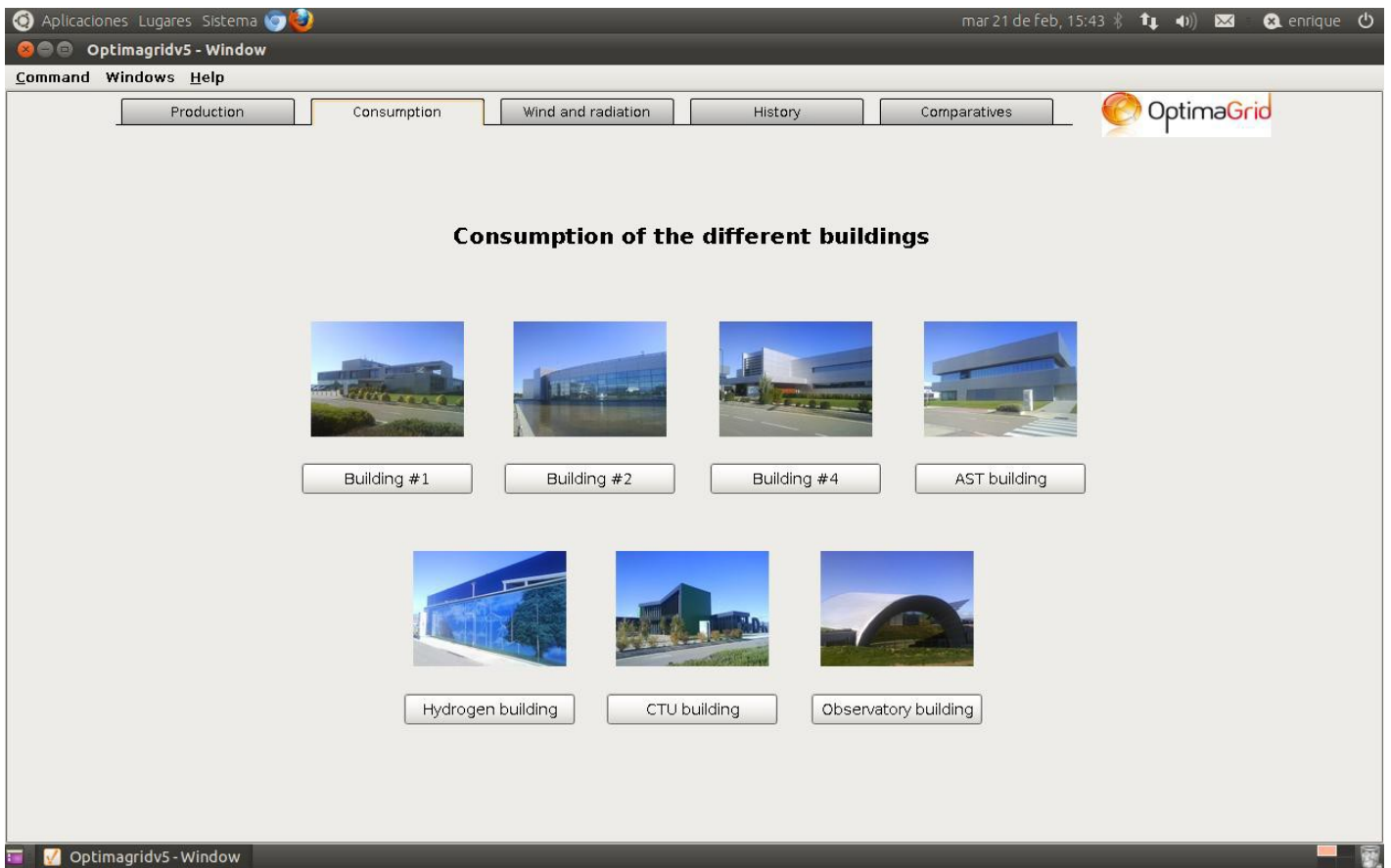


Fig. 6 – The consumption screen.

Here by default it is selected “Voltage” and “Last 24 hours”, although it saves the last selection we do (if we close the window after selecting “Intensity” and “Last week” and open a new one for other building, we will see that magnitude and period of time). In this case we have recent data for almost every building (although there may be some gaps, but in this screen that does not matter). The graphic may take some seconds to reload if we select a long period of time due to the great amount of data.

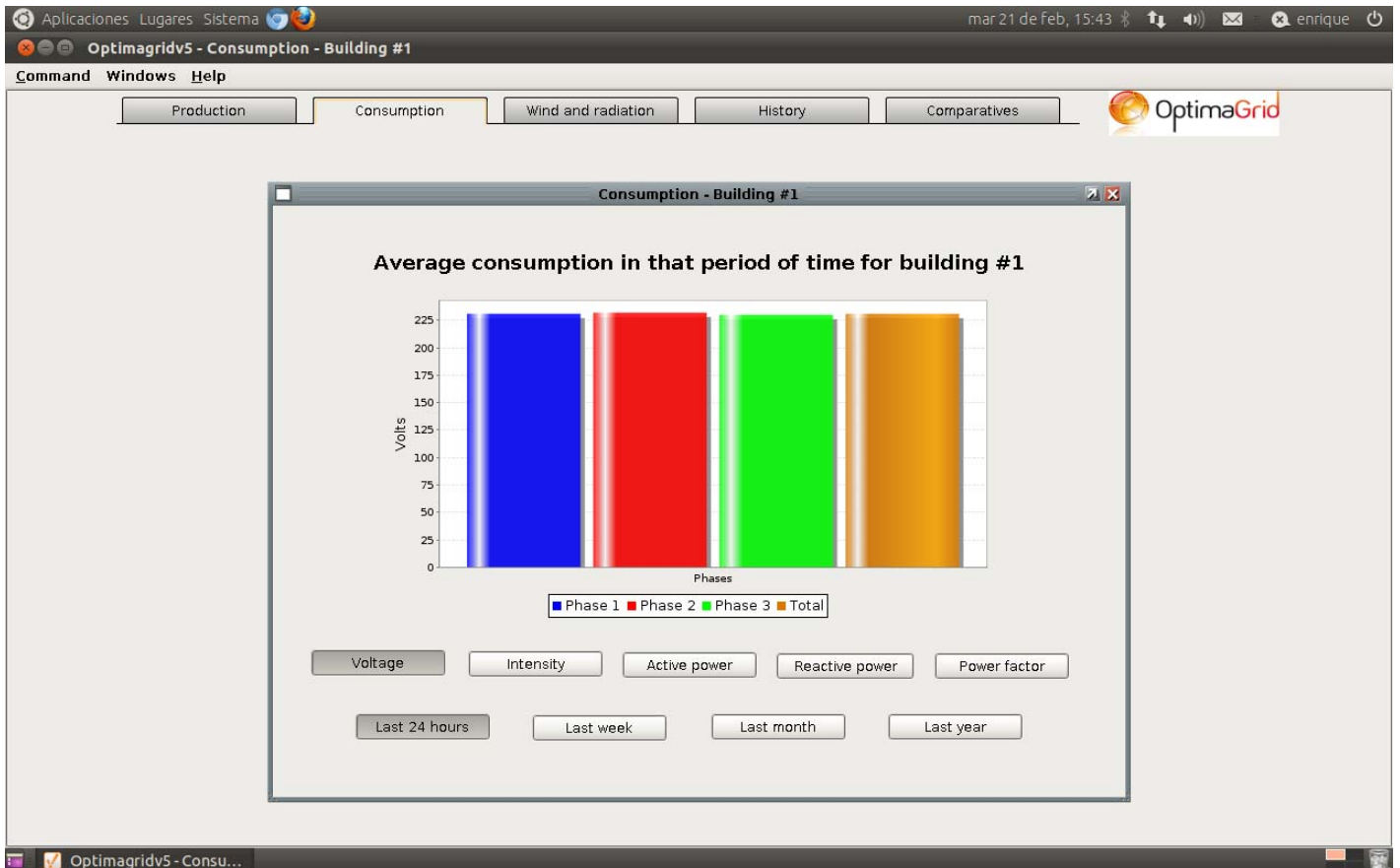


Fig. 7 – Window with data about power consumption of one of the buildings.

5 WIND AND RADIATION SCREEN

This screen shows us the weather parameters monitored by the SCADA: air pressure, temperature, wind direction and speed (again, the average in the selected period of time). Air pressure is represented with a tank, and depending of its value the content will be green (OK, good pressure), brown (not so good) or red (stormy weather). Temperature is shown with a thermometer (and in Celsius degrees), wind speed is measured in Km / h and its direction is represented with a compass. Unfortunately, we have only data for “Last year” option, by now.

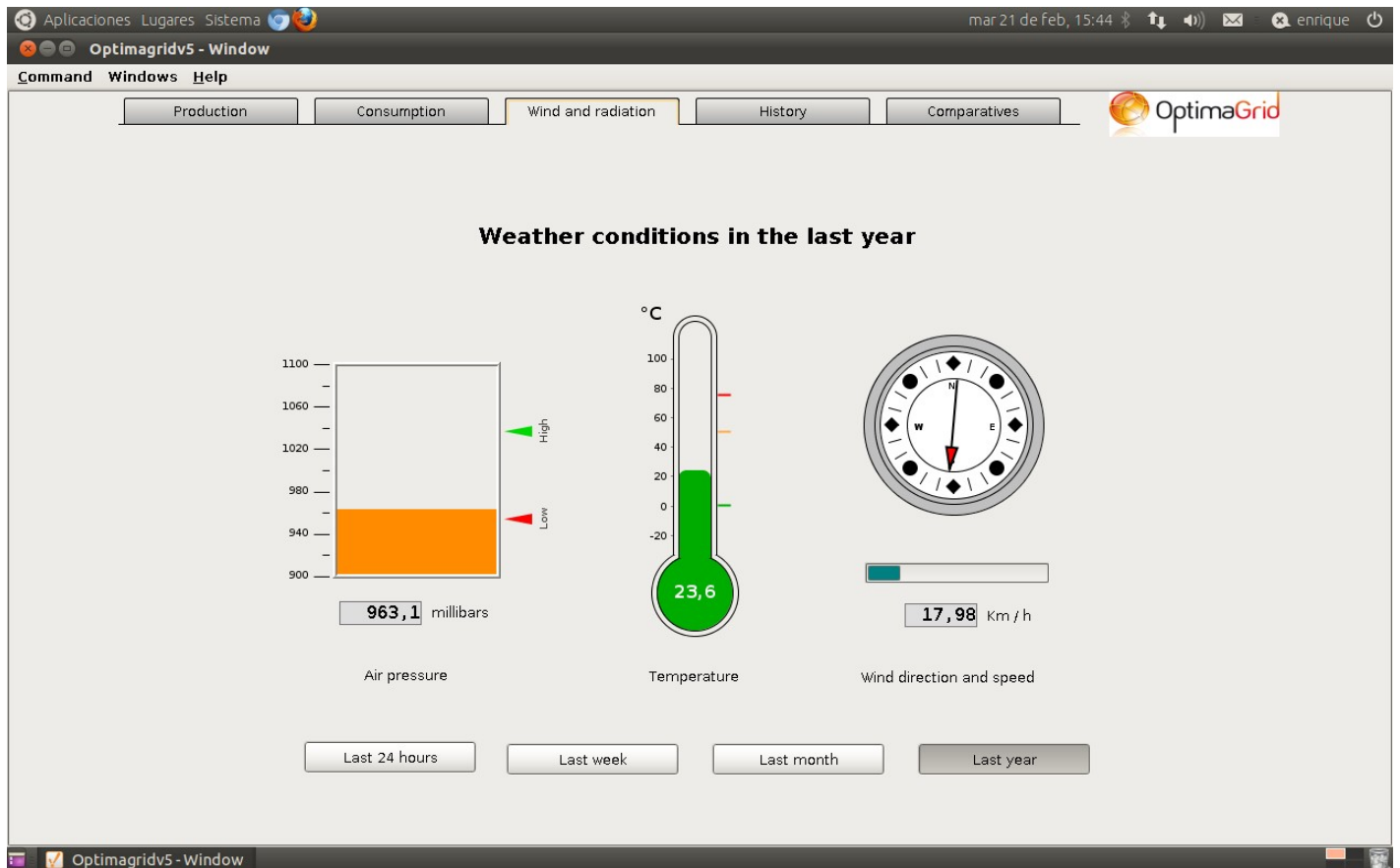


Fig. 8 – The wind and radiation screen.

6 HISTORY SCREEN

This section is designed to show historical data about power production, consumption or weather data. The first screen allows us to choose the generator, building or weather magnitude we want to see. When we click on the button below any of the images, the SCADA will open a window showing a line graphic. This is the same for every button except the “Wind” one, which is a bit different.

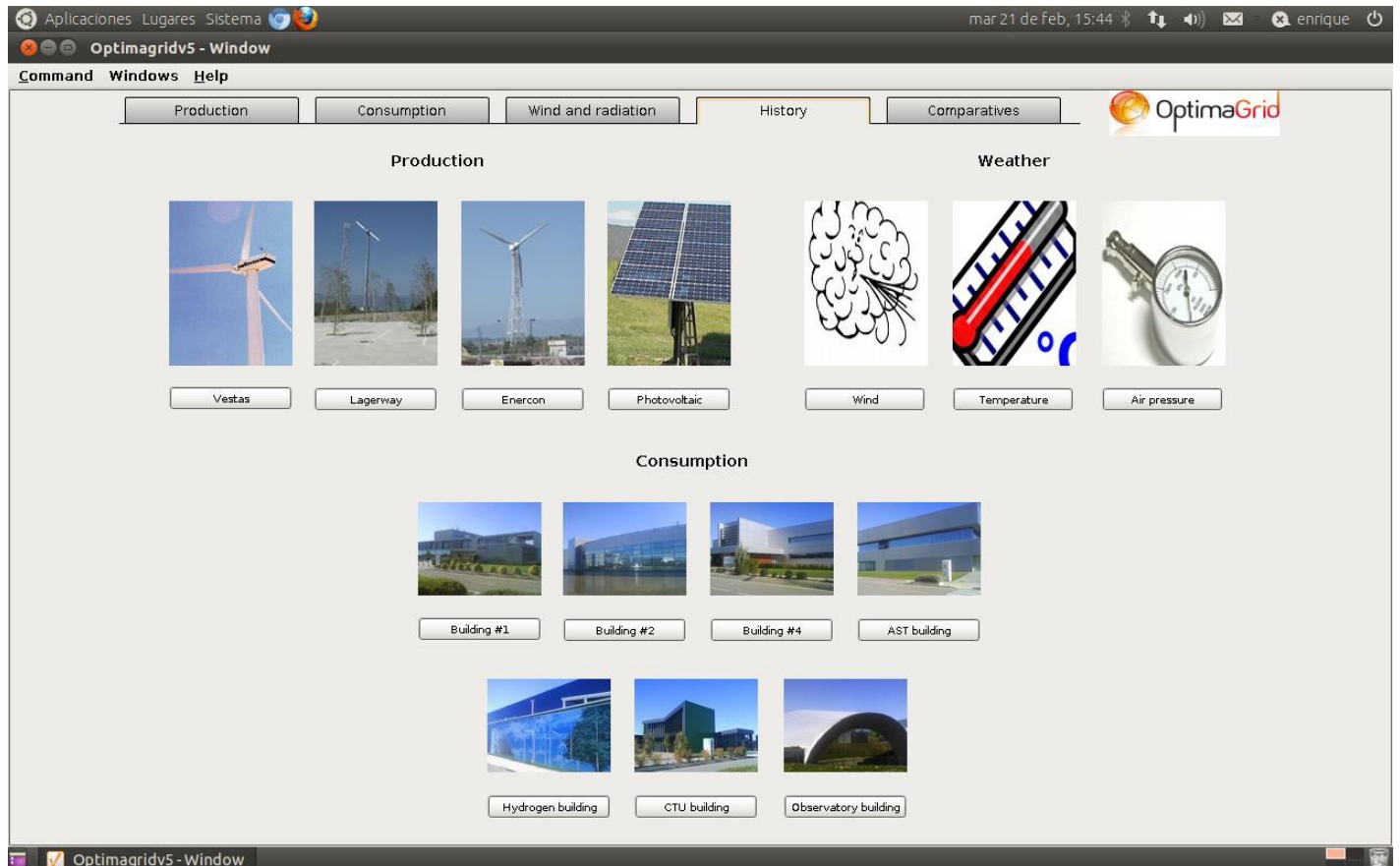


Fig. 9 – The history screen.

The window shows the title (what we are seeing), the graphic with the values and the measure used (generally watts), the represented pens (we can select to show any of them just by clicking in the small square to the left and in the “Apply” button, that will self-enable), some options to the right (increase the size of the graphic, print it or save the represented data to an excel file) and the selected period of time.

We can click on the small magnifiers in the sides of the date to increase or decrease the period of time we see below. We can also click and drag the square over the red bar to choose the period of time we want to see (in that bar, red means “there are values in this period of time”, while white gaps represent “no data in this date”).

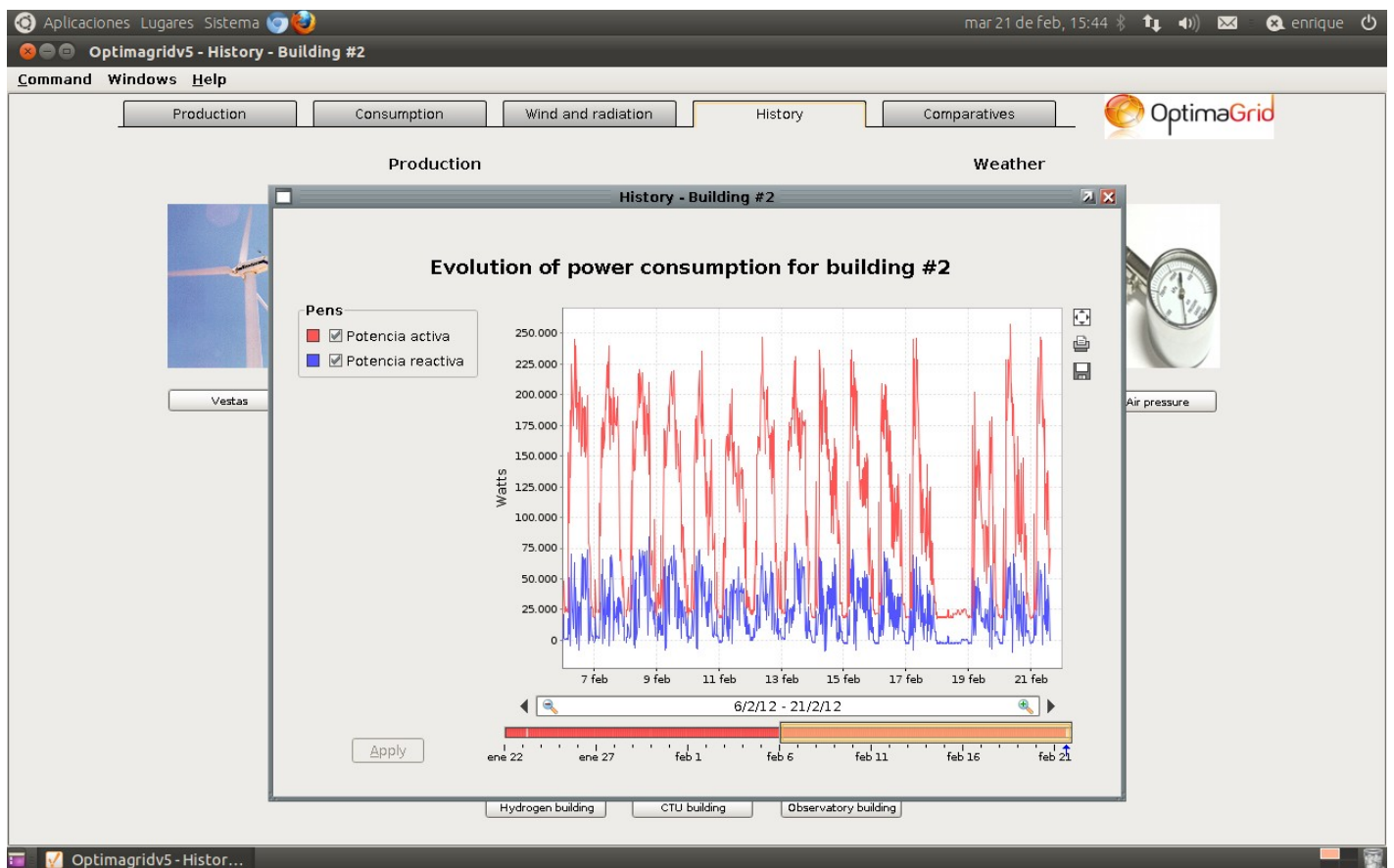


Fig. 10 – Window with history data about power consumption of one of the buildings.

All windows are the same except for wind history. Here we will also find a representation of the wind direction using a color scale and a compass. It is usually very hard to draw a graphic for that magnitude (it usually shows a lot of asymptotes), so we have designed this method to do so. It is very easy to see tendencies with this chart. The represented period of time is controlled with a slide below (we have only data corresponding to some months of the last year, so by now it only works the “Months” choice). The time period is independent for the chart and the line graphic.

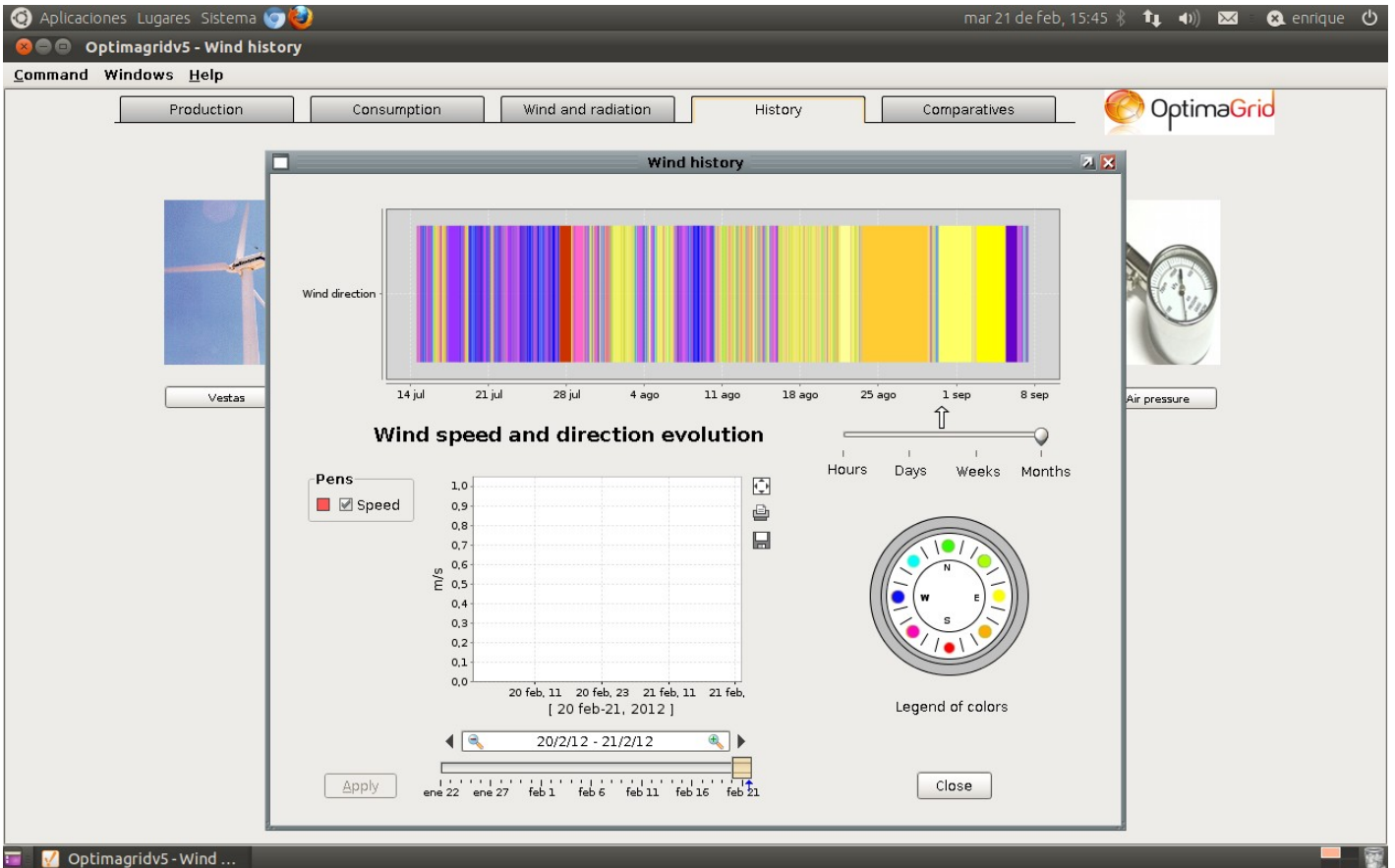


Fig. 11 – Window with history data about wind speed and direction.

7 COMPARATIVES SCREEN

The last screen shows two pie charts where we can see the active / reactive power production or consumption for all the generators and buildings monitored by the SCADA. The magnitude an period of time is selected using the buttons below. The measuring unit is the Kilowatt-hour. The charts may take some time to refresh (specially the right one), and as we said before, by now we have only data from two of the generators in the last year, so that graphic will be blank if we choose a smaller period of time.

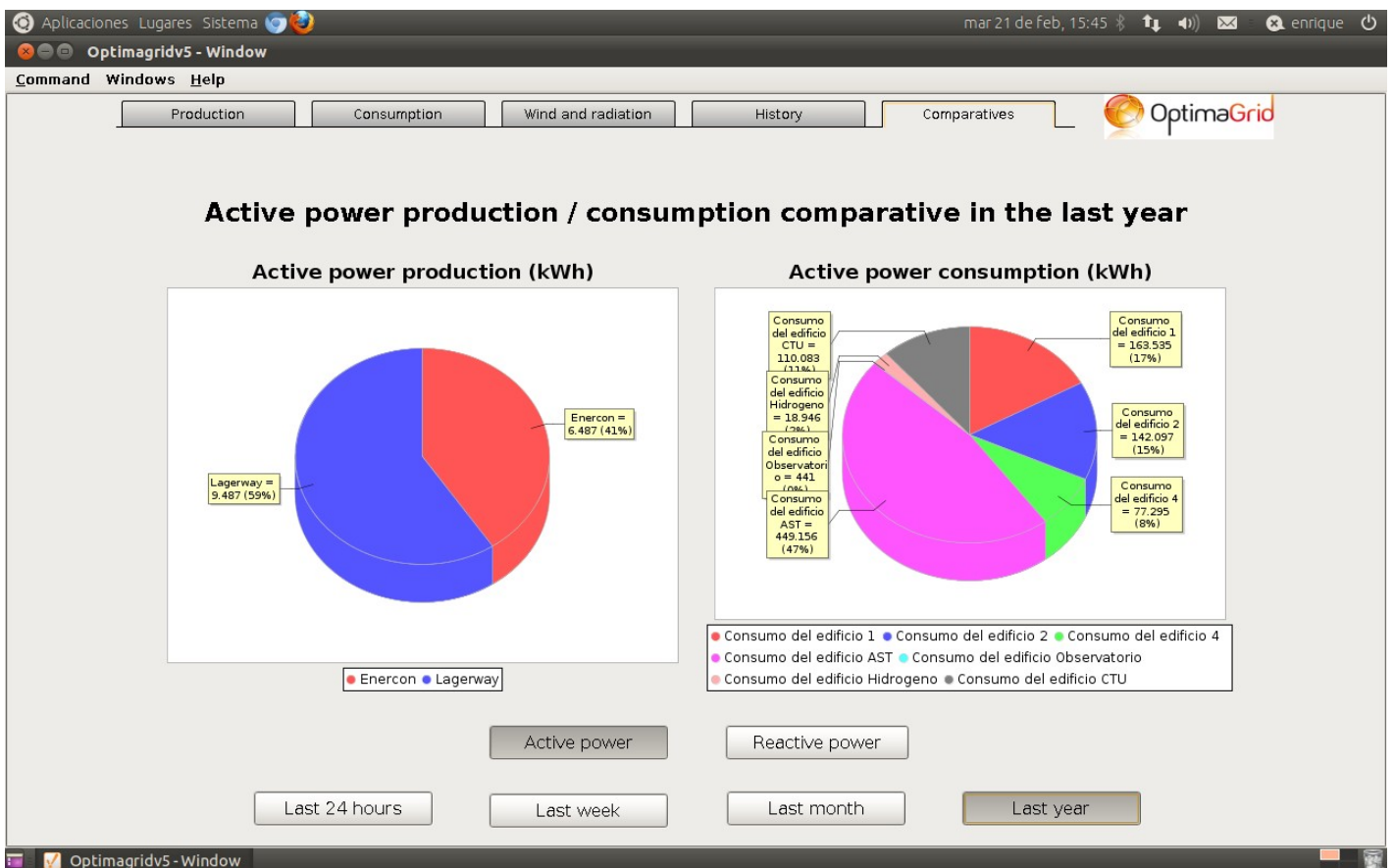


Fig. 12 – The comparatives screen.

8 REFERENCES

- [1] Inductive automation's webpage at www.inductiveautomation.com.