ΚΑΠΕ CRES | ΚΕΝΤΡΟ ΑΝΑΝΕΩΣΙΜΩΝ ΠΗΓΩΝ ΚΑΙ ΕΞΟΙΚΟΝΟΜΗΣΗΣ ΕΝΕΡΓΕΙΑΣ

Alternativ və Bərpa Olunan Enerji Mənbələri üzrə Dövlət Agentliyi
ABEMDA

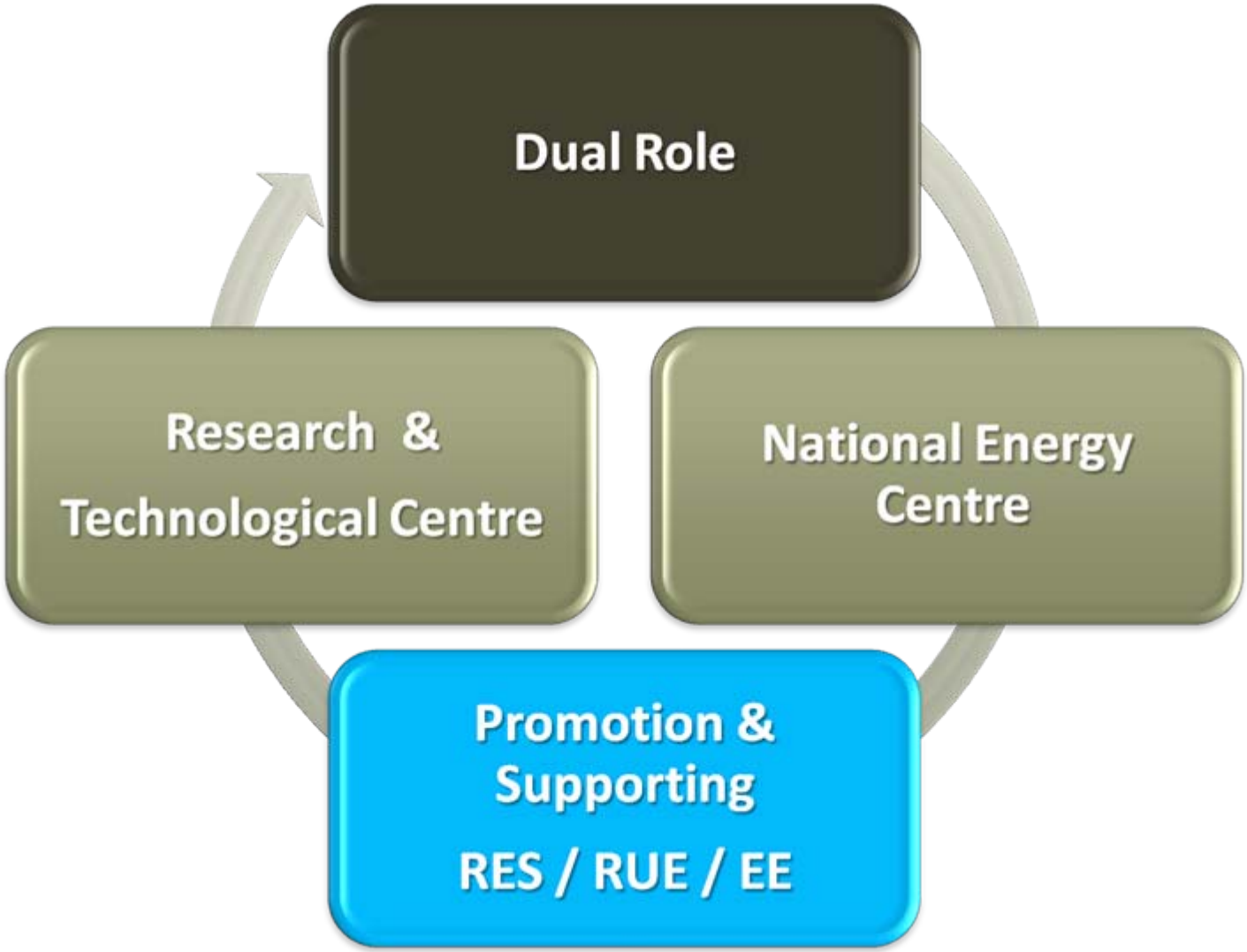
BSEC HDF

Greening Public Buildings in Azerbaijan: Promotion of Energy Efficient Materials and Technologies

BSEC-HDF / RES 06 - 2012

CRES

- The Centre for Renewable Energy Sources and Saving (CRES) is the Greek national centre for Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (ES)
- CRES was founded in September 1987, it is supervised by the Greek Ministry for the Environment, Energy and Climate Change, and has financial and administrative independence.
- Its main goal is the promotion of RES/RUE/ES applications at a national and international level, as well as the support of related activities taking into consideration the environmental impacts, in the energy supply and use.


Dual Role
National Energy Centre
Promotion & Supporting
RES / RUE / EE
Research & Technological Centre

Premises

The laboratories

Bioclimatic office Building

Park of Energy Awareness

- Demonstration of RES systems technologies
- Located in Keratea Attiki

Personnel & Networks

Scientific staff of 110 highly qualified engineers and other scientists

(the total personnel number: 165 people).

Annual turnover: 10 million Euro

CRES co-operates with other institutes, organisations, universities, consultants, international organisations

(such as the IEA, UNESCO, ISES, PLEA, IEC, CEN, etc)

It is an active member of various European and international networks, such as the EnR, MEDENER, EUFORES, EWEA, DYNASTEE, MEASNET, EUREC Agency, etc.

Projects

- R&D projects,
- demonstration & pilot and Integrated projects,
- energy information systems and energy modelling,
- energy policy studies,
- investment feasibility studies, techno-economic studies, market research, support SMEs
- environmental impact assessments
- training and promotional activities on the RES/RUE/ES related issues.
- Technical assistance to third Countries

Description of the project

- Installation of a 25 kWp grid connected PV system
- Installation of energy efficient lighting systems
- Installation of 6 autonomous PV lighting systems
- Installation of a 5 kWp PV system with storage
- Installation of a Solar Thermosyphonic System for hot water

School in Turcan

School in Badamar, Baku

Technical Visit in Azerbaijan (1)

Turcan

- Due to structural shortcomings of the main building and a complicated procedure for erecting a new structure (because of the need for licenses from the urban planning department) it was decided that the PV array would be installed on the boiler room building.
- Since this building is in the back it was decided that a small array (~1 kWp) would be installed above the entrance of the main building for better demonstration effect.

Technical Visit in Azerbaijan (2)

Turcan

- The interventions in this building also include the replacement of 1000 light bulbs with energy efficient ones.
- All needed data (topographic, electrical, photographs etc.) was collected in order to facilitate the design study.

Technical Visit in Azerbaijan (3)

Baku

- In the Badamdar school a 5 kWp PV array is to be installed, along with a solar water heating system and energy storage for the energy produced by the PV array.
- The structural stability of the main roof of the building was considered to be adequate and thus both the PV array and the solar water heater are going to be installed there. The installation will be on the part of the roof facing approximately south.

Technical Visit in Azerbaijan (4)

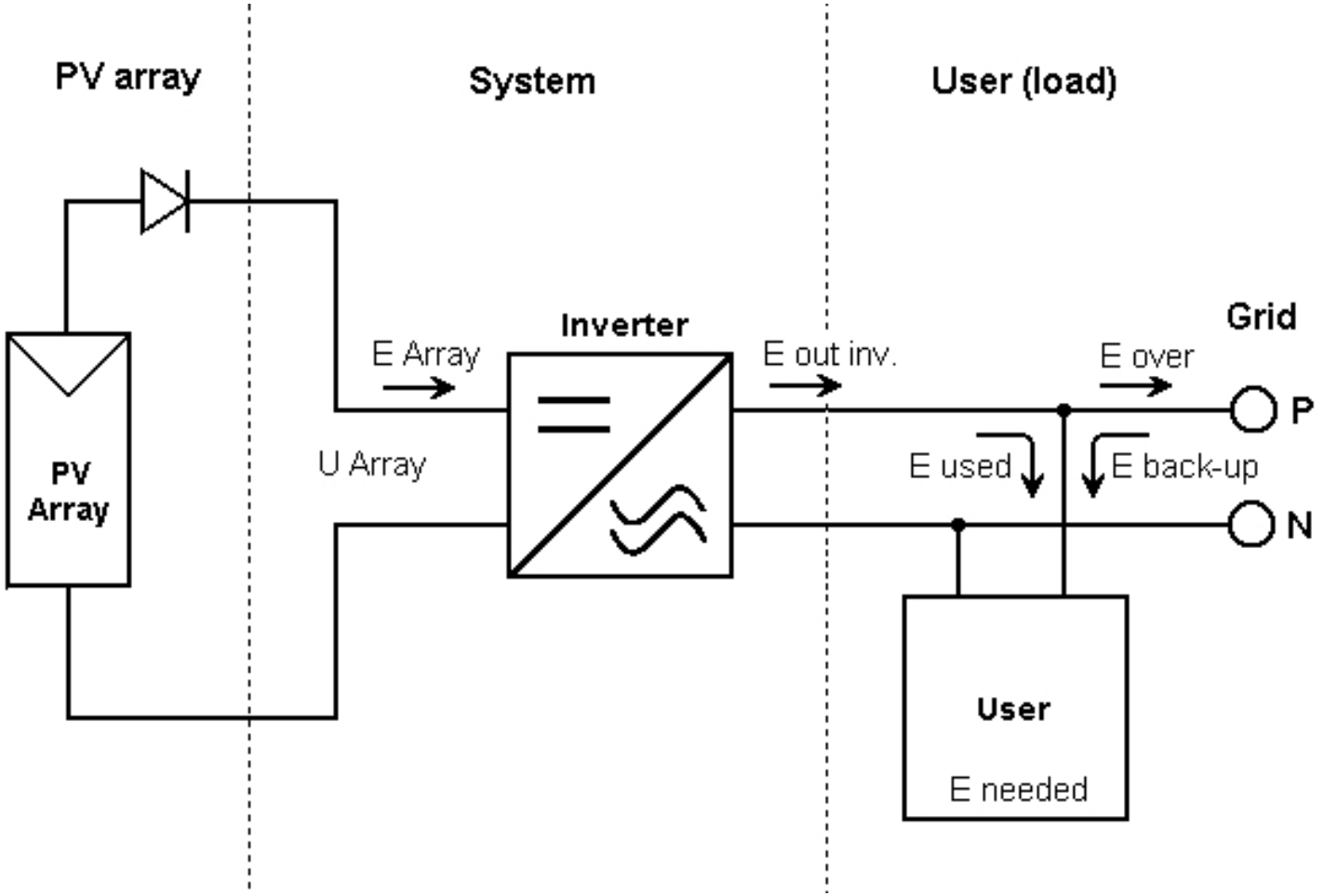
Baku

- Energy storage will take place in a computer room. There a number of UPS systems are going to be installed with a total nominal installed power of about 9 kVA.
- The interventions in this building also include the replacement of 300 light bulbs with energy efficient ones.
- All needed data (topographic, electrical, photographs etc.) was collected in order to facilitate the design study.

Design of the PV Systems

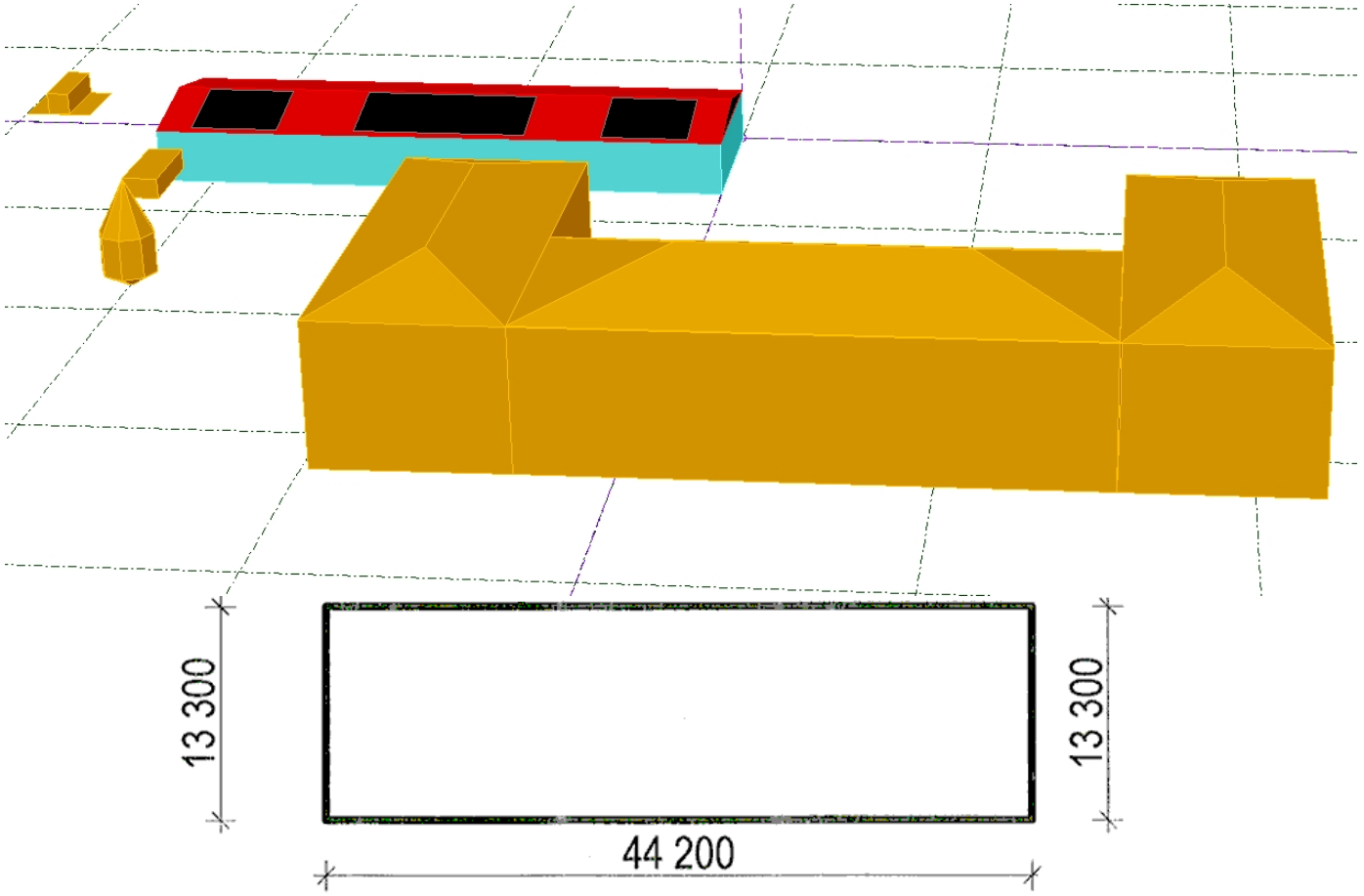
- The design was carried out with the use of the PVSyst 5.55 software suite. The available meteorological data for Baku, Azerbaijan are synthetic satellite hourly data obtained from NASA-SSE.
- The PV module considered is the Azguntex MMC 245 Wp (Made in Azerbaijan).

Electrical diagram

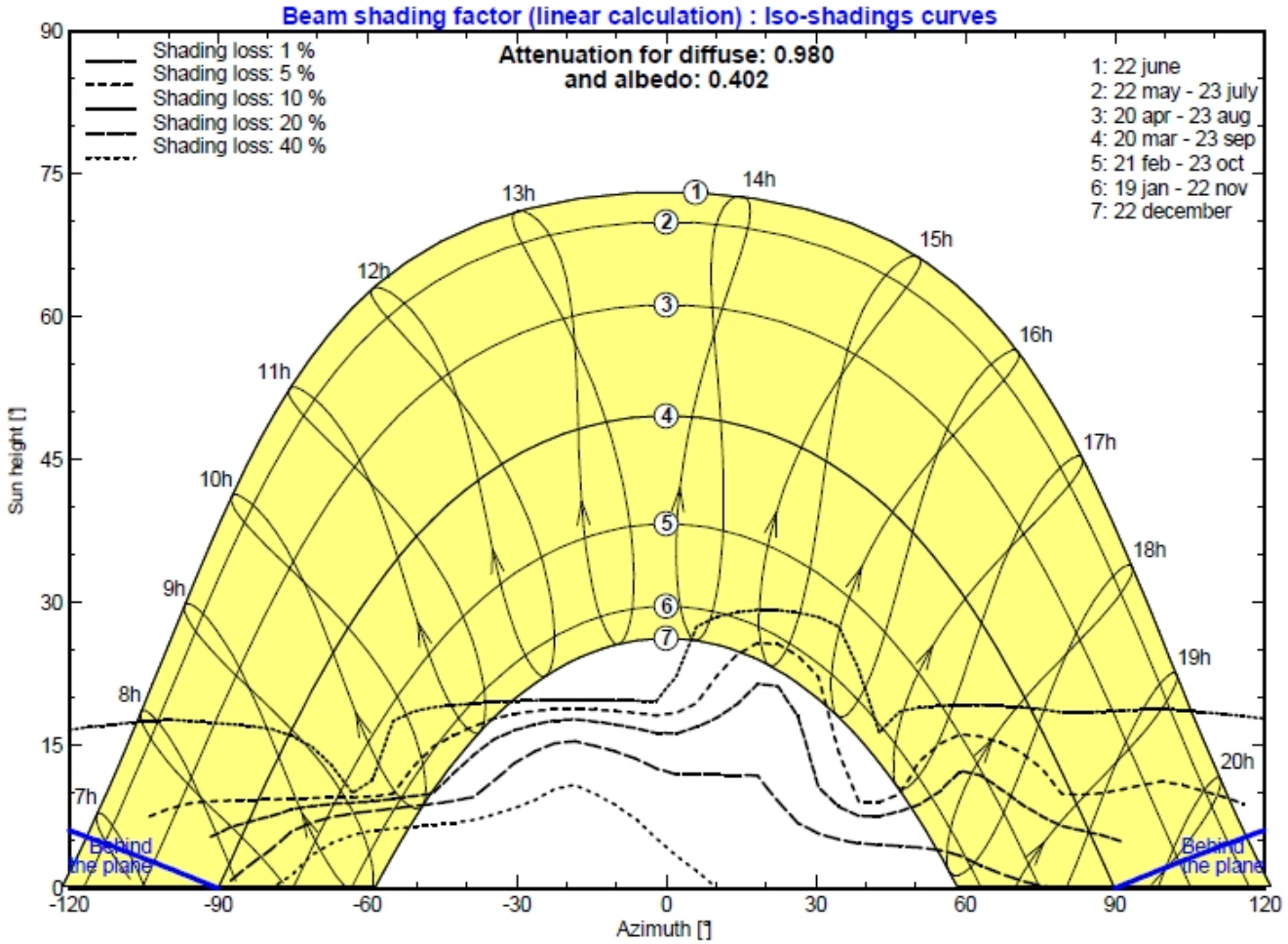


Turcan – 24 kWp array (1)

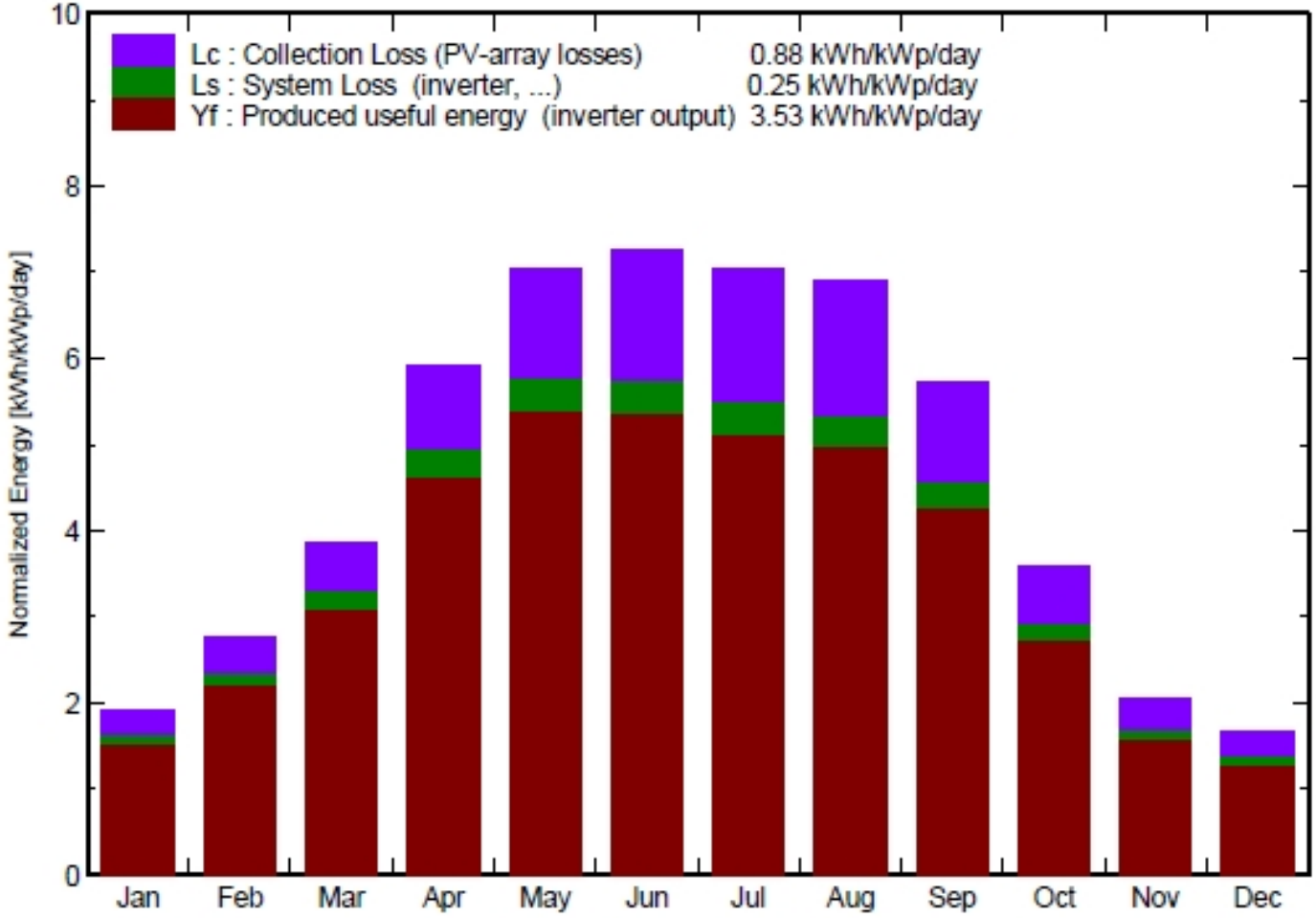
Turcan – 24 kWp array (2)



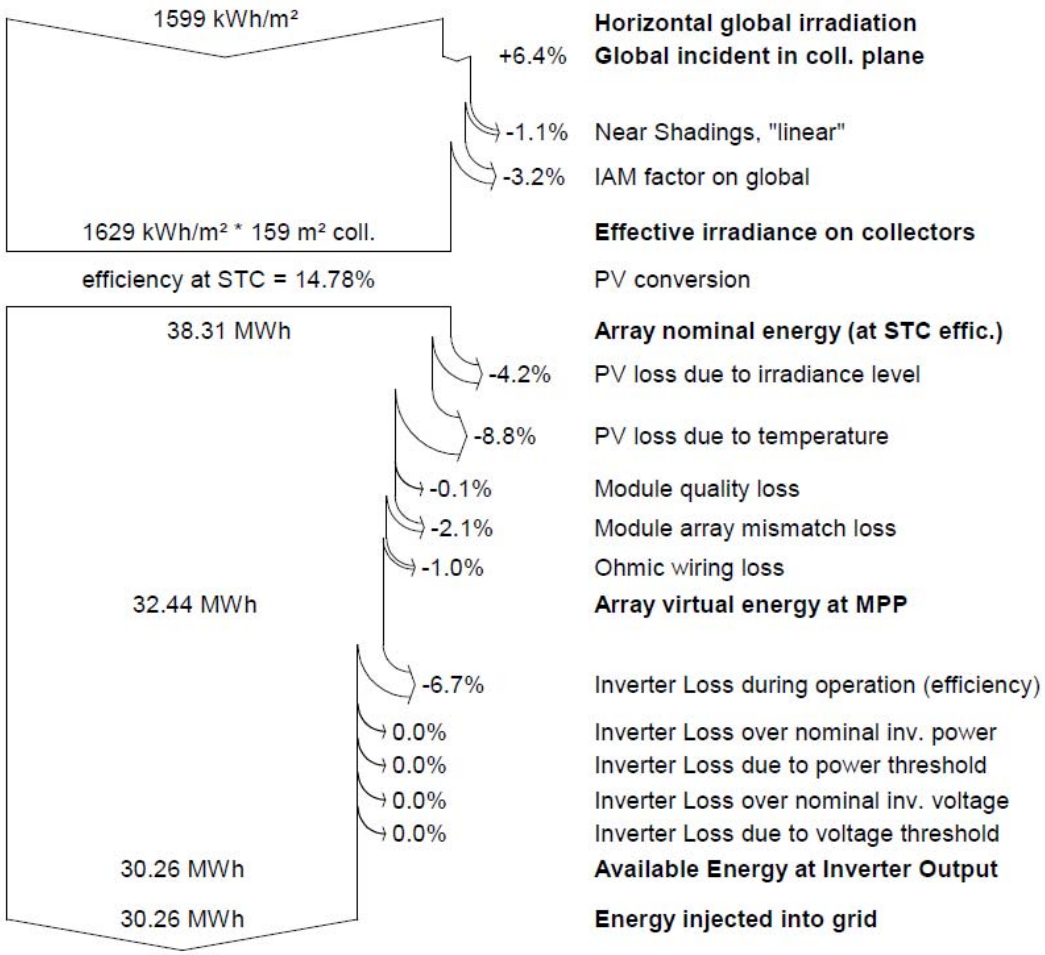
Turcan – ISO shadings diagram



Turcan – Energy Production

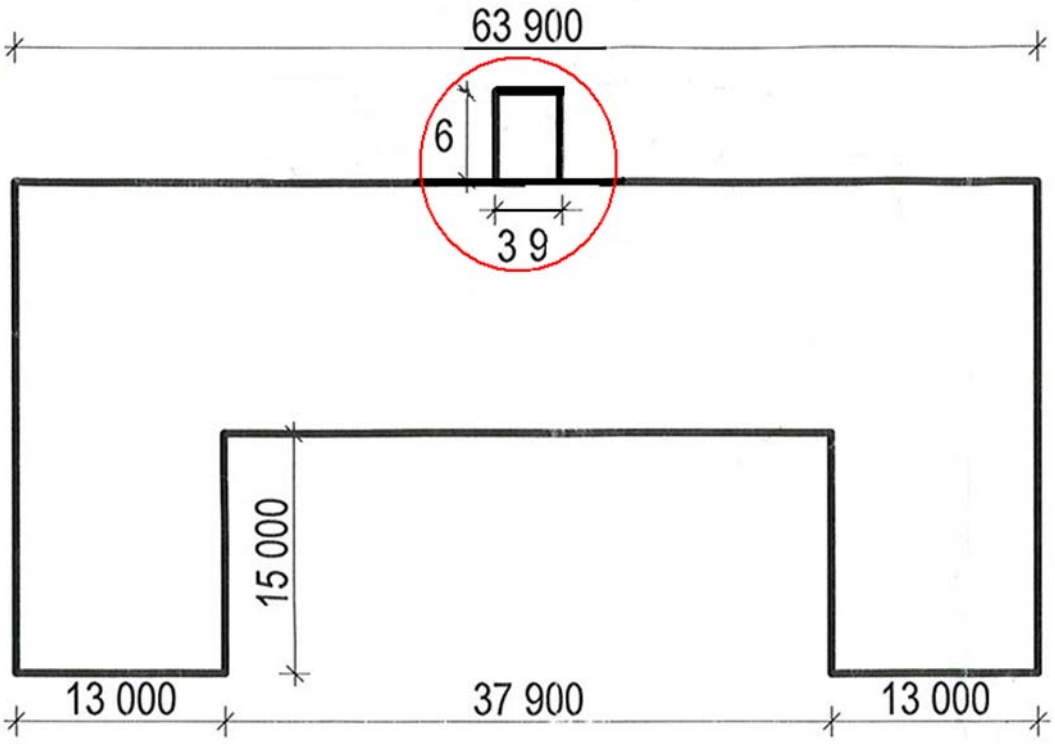


Turcan – Electrical Losses

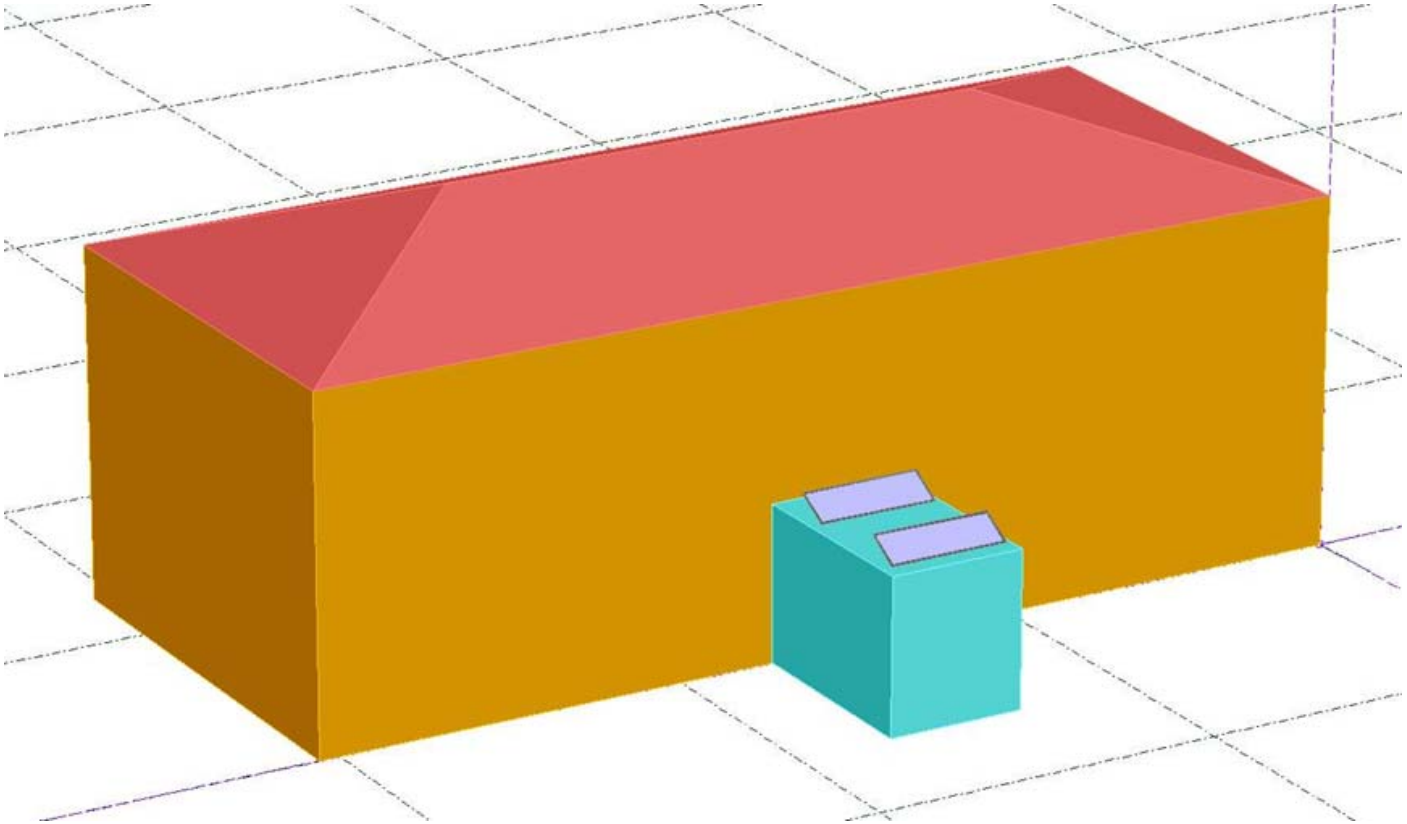


Turcan – 1 kWp array (1)

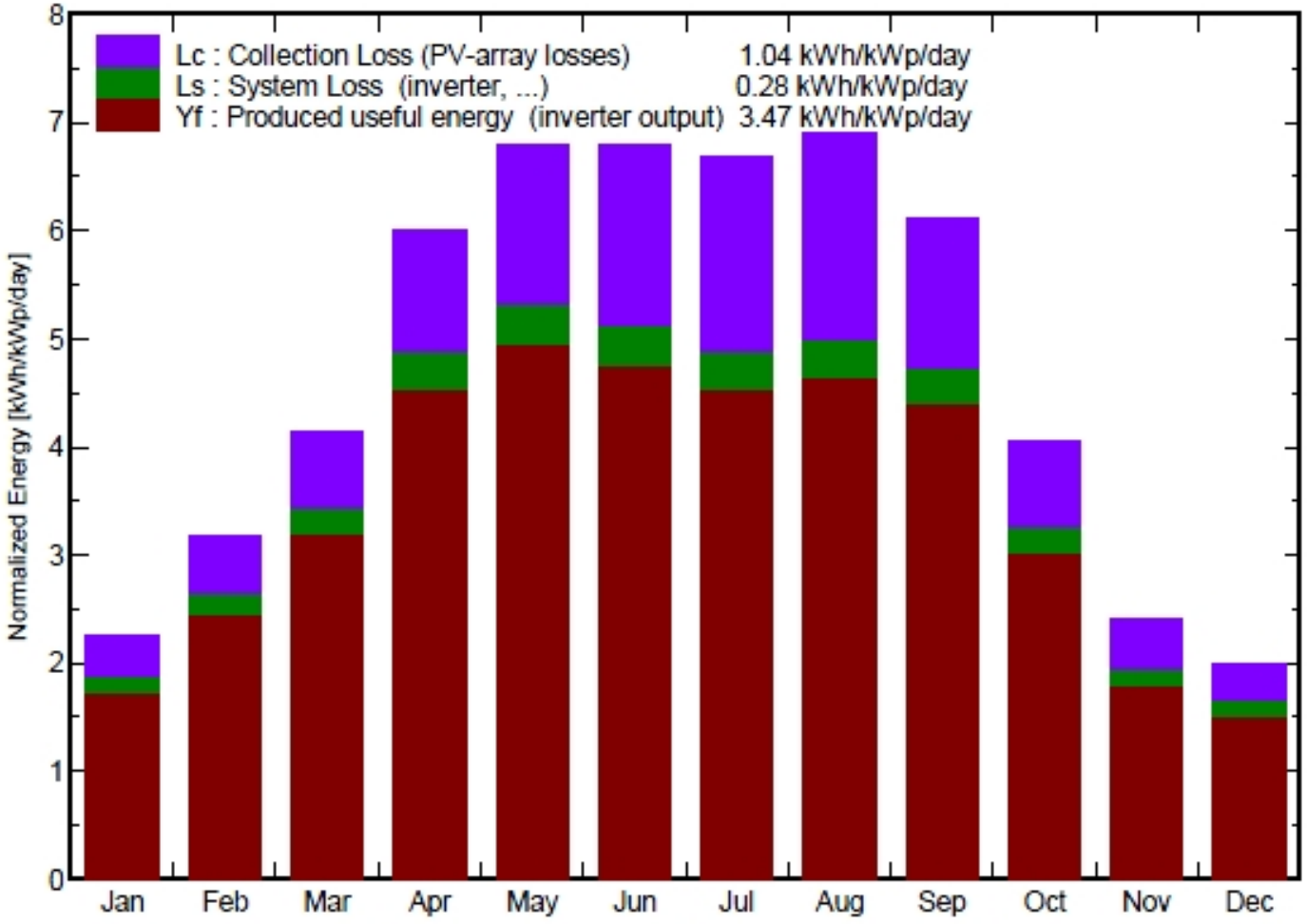
Turcan – 1 kWp array (2)



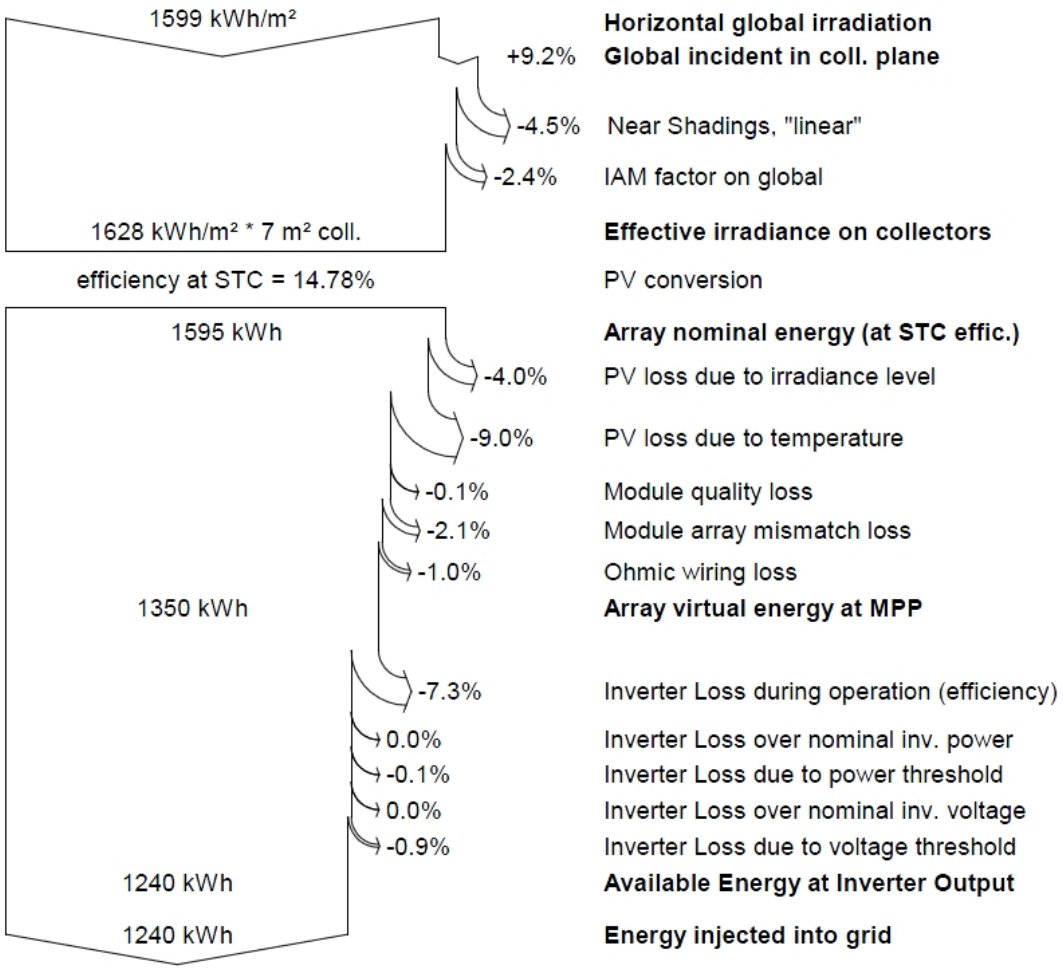
Turcan – 1 kWp array (3)



Turcan – Energy Production

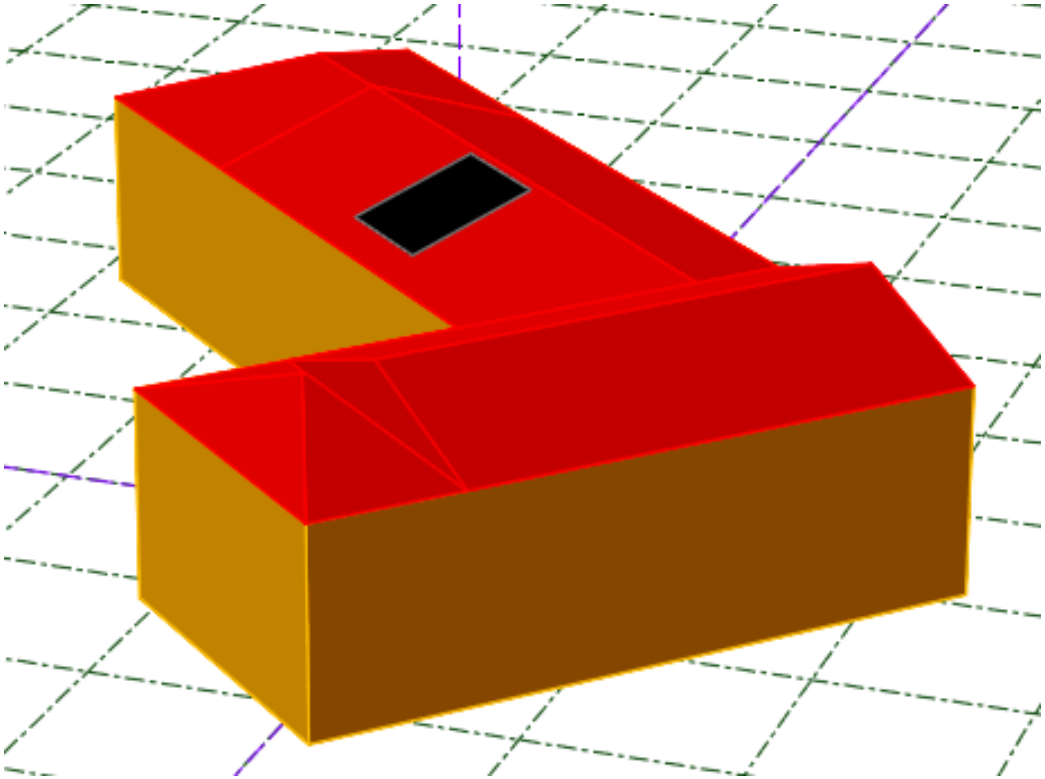


Turcan – Electrical Losses

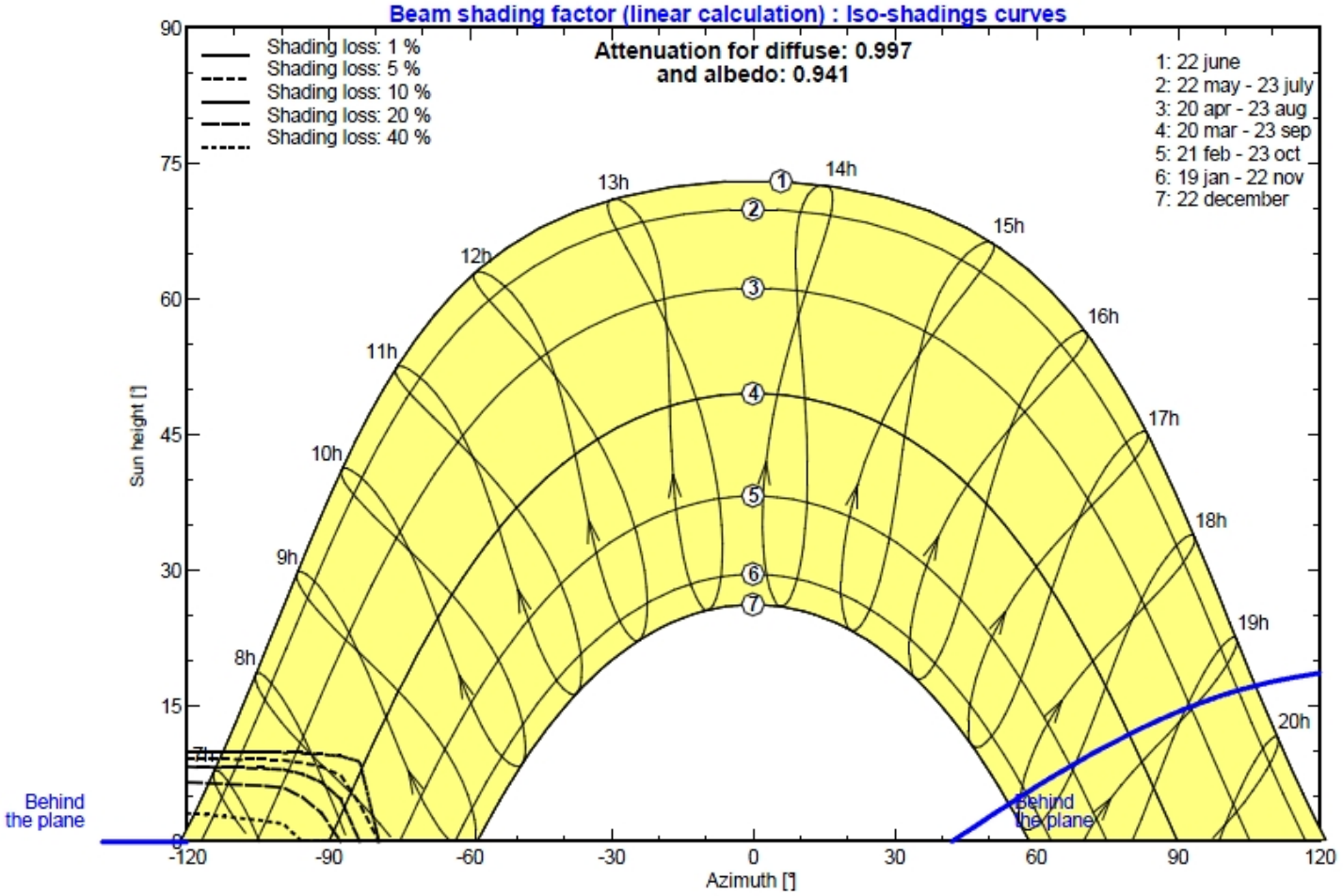


Baku – 5 kWp array (1)

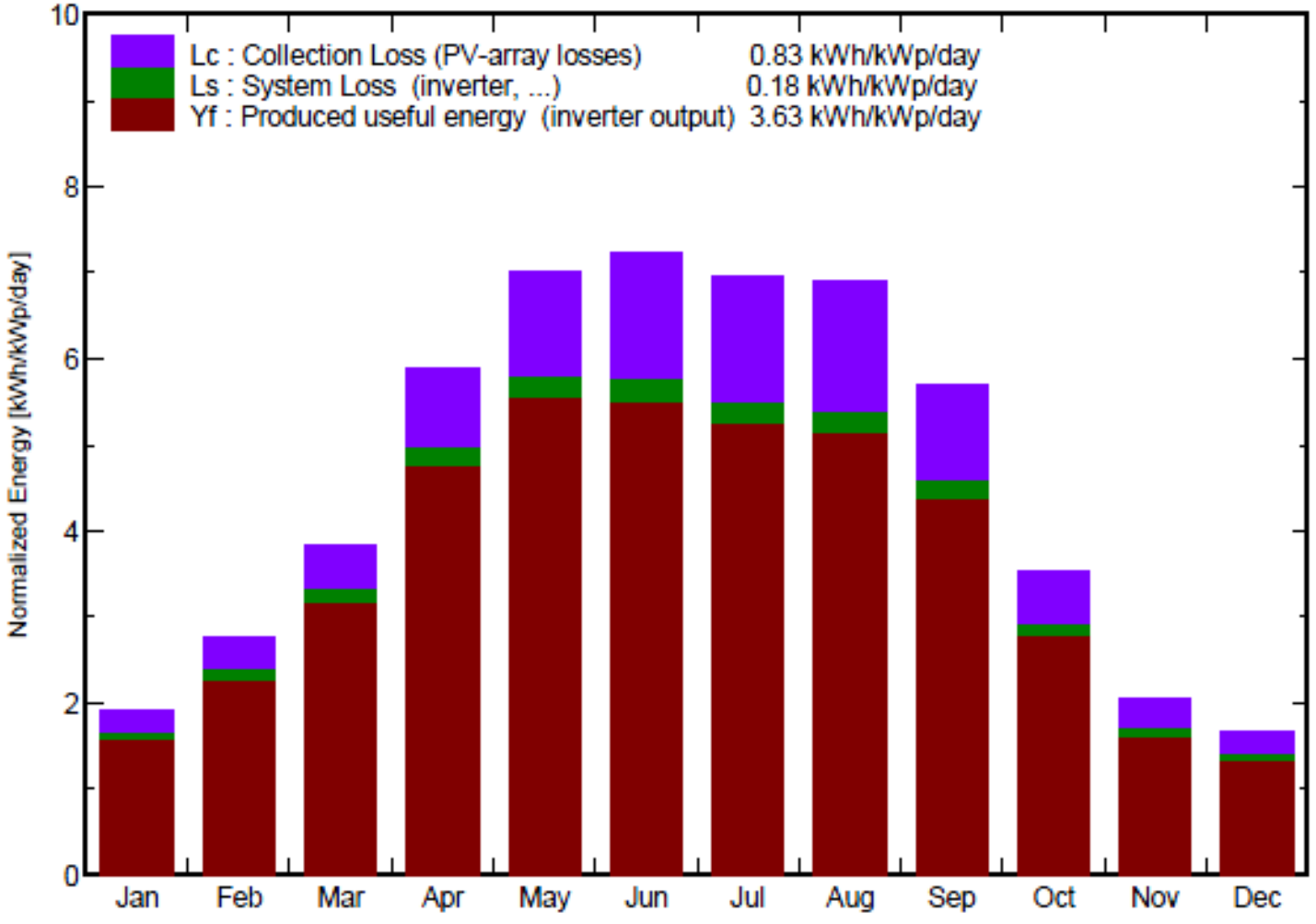
Baku – 5 kWp array (2)



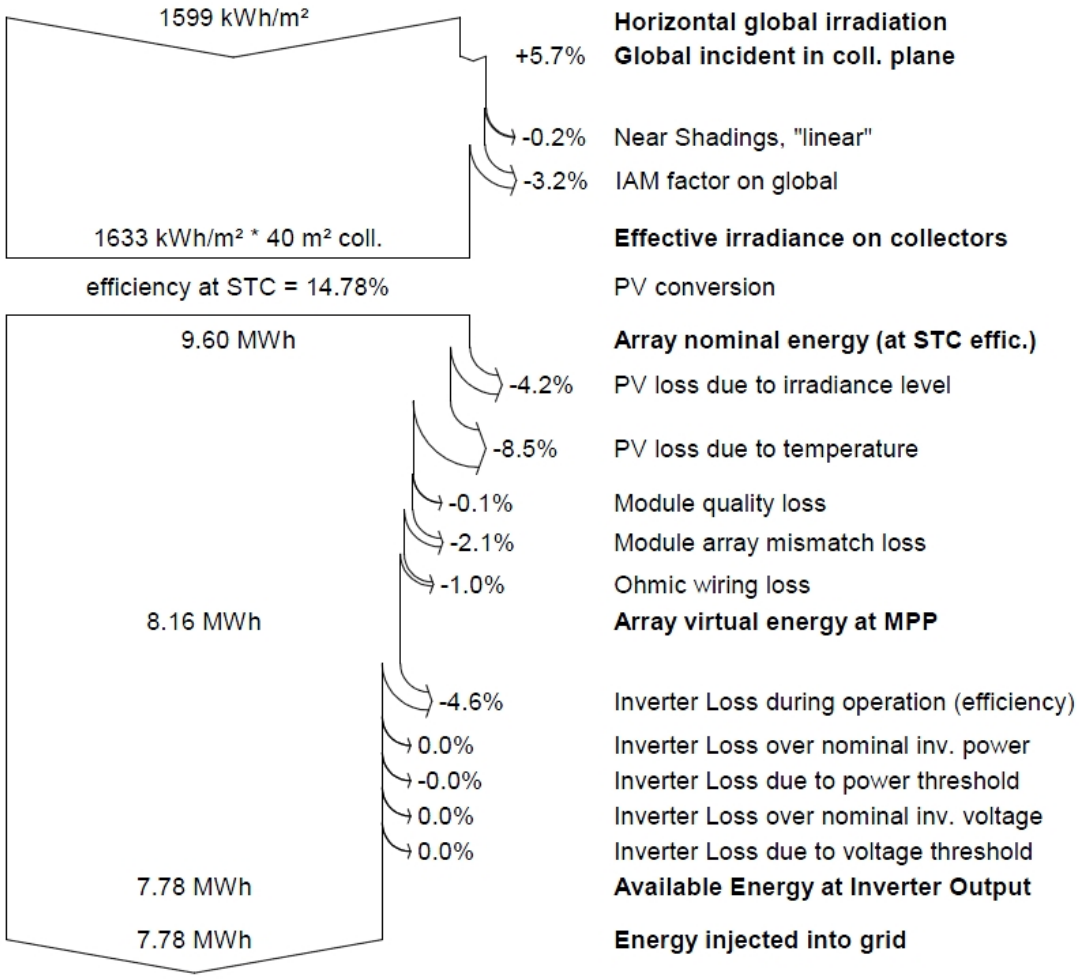
Baku – ISO shadings diagram



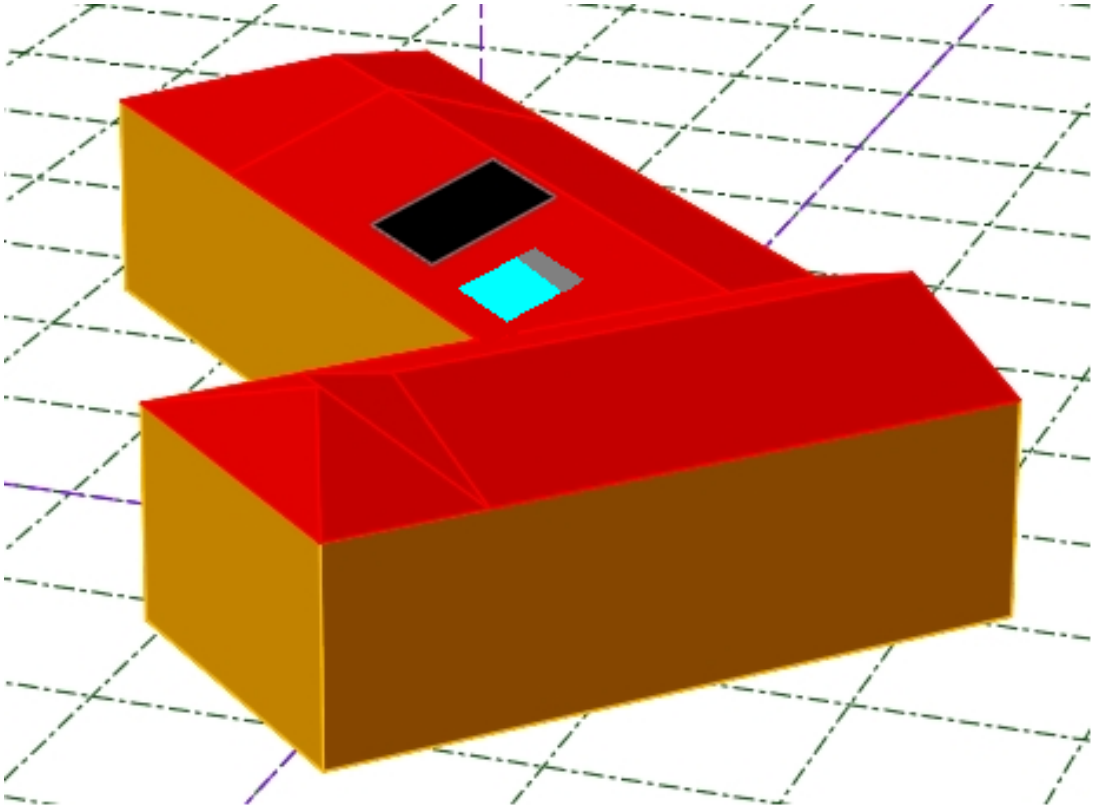
Baku – Energy Production



Baku – Electrical Losses



Baku – Solar Water Heating System



Baku – Solar Water Heating System

Month	Thermal Energy Needed (kWh_{th}) (1)	Thermal Energy Produced by the Solar Water Heating System (kWh_{th}) (2)	Meeting of the demand ratio (2)/(1)
January	248.96	38.30	0.15
February	248.96	64.90	0.26
March	248.96	121.40	0.49
May	248.96	179.82	0.72
June	248.96	229.95	0.92
July	248.96	238.69	0.96
August	248.96	273.04	1.10
September	248.96	245.87	0.99
October	248.96	192.60	0.77
November	248.96	86.20	0.35
December	248.96	62.10	0.25
TOTAL	2738.51	1732.86	0.63

Lighting systems

Equipment procurement

- Open tender took place
- The company that won the tender has to supply the equipment before the end of October 2012
- High quality equipment – inverters supported by 20 years manufacturer's warranty

Installation

- The equipment are to be transported to Azerbaijan in the first half of November 2012.
- Installation is expected to take place before the end of 2012

Thank you for your attention

CRES team:
-Christos Nychtis
-George Kyriakarakos
-Dimitrios Papastefanakis

Contact:
Telephone: **+30 210 6603300**
Email: **cnychtis@cres.gr**
gk@cres.gr

ΚΑΠΕ CRES | ΚΕΝΤΡΟ ΑΝΑΝΕΩΣΙΜΩΝ ΠΗΓΩΝ ΚΑΙ ΕΞΟΙΚΟΝΟΜΗΣΗΣ ΕΝΕΡΓΕΙΑΣ

Alternativ və Bərpa Olunan Enerji Mənbələri üzrə Dövlət Agentliyi
ABEMDA

BSEC HDF

Greening Public Buildings in Azerbaijan: Promotion of Energy Efficient Materials and Technologies

BSEC-HDF / RES 06 - 2012