



Libre Evolucion de Energia S.L.

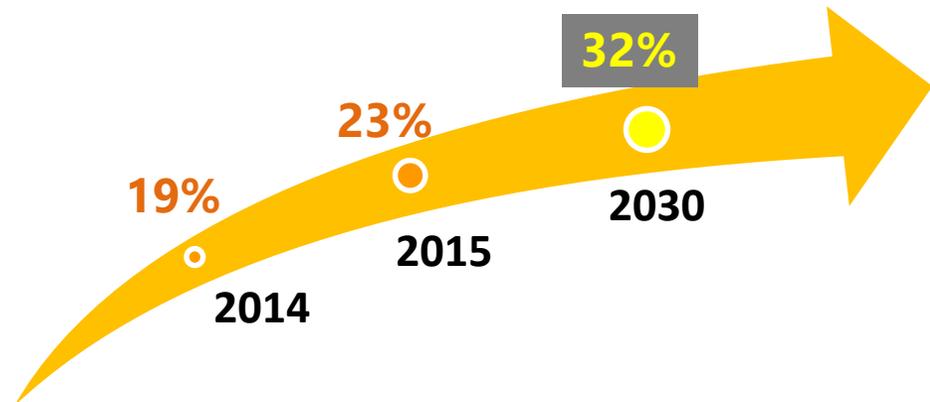
Facade
system
FREENERGY



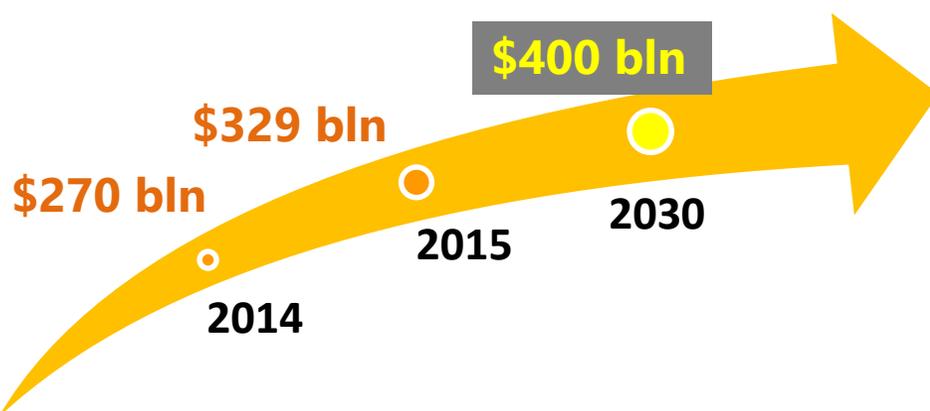
Renewable Energy Sources



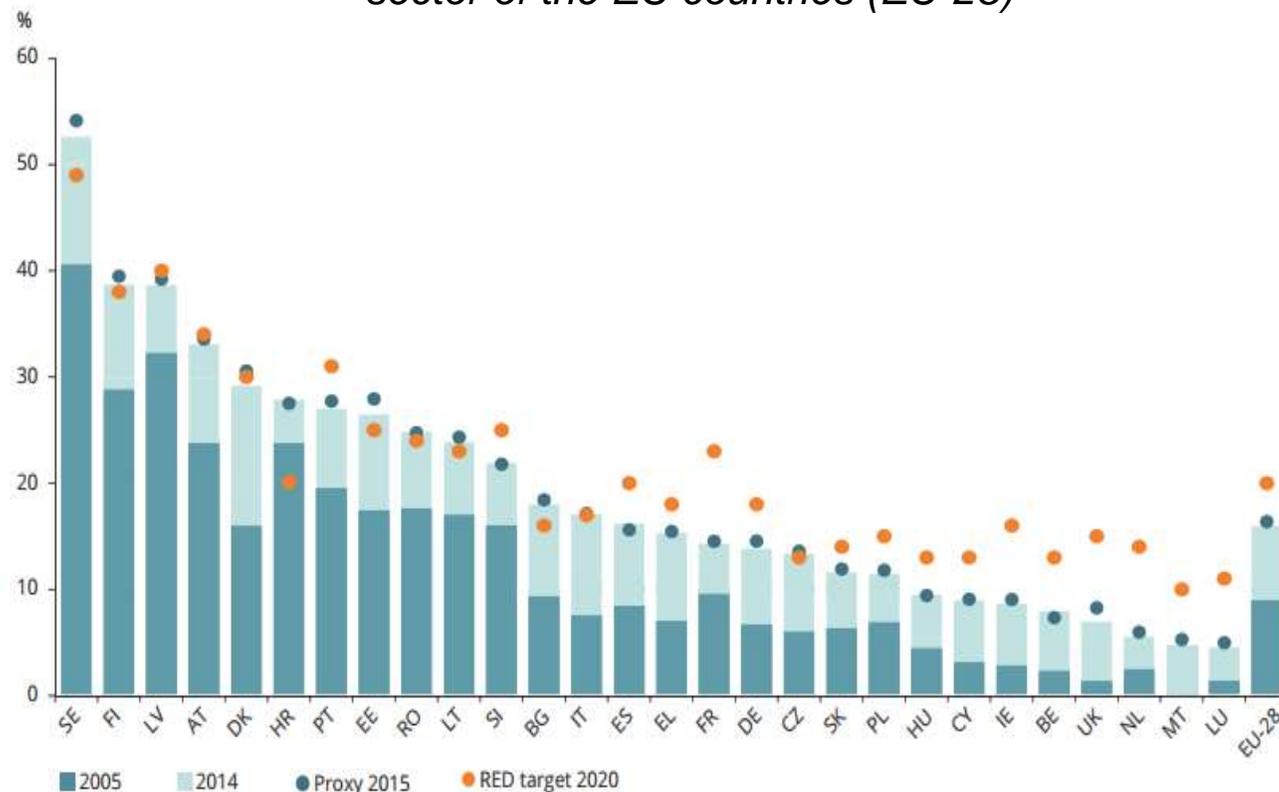
Share of renewable energy in total final energy consumption in the world



Investments in renewable energy around the world

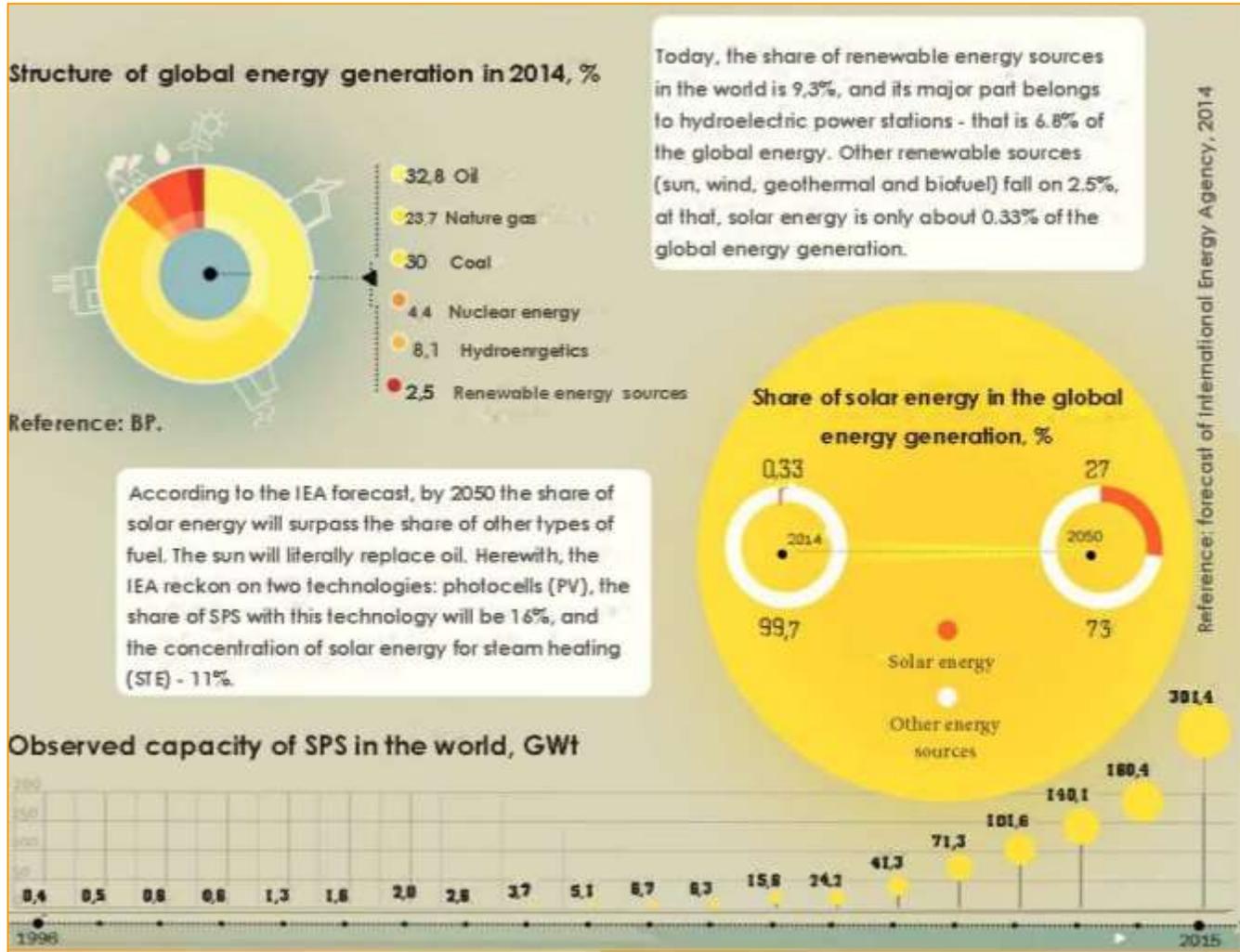


Contribution of renewable energy sources in the energy sector of the EU countries (EU-28)

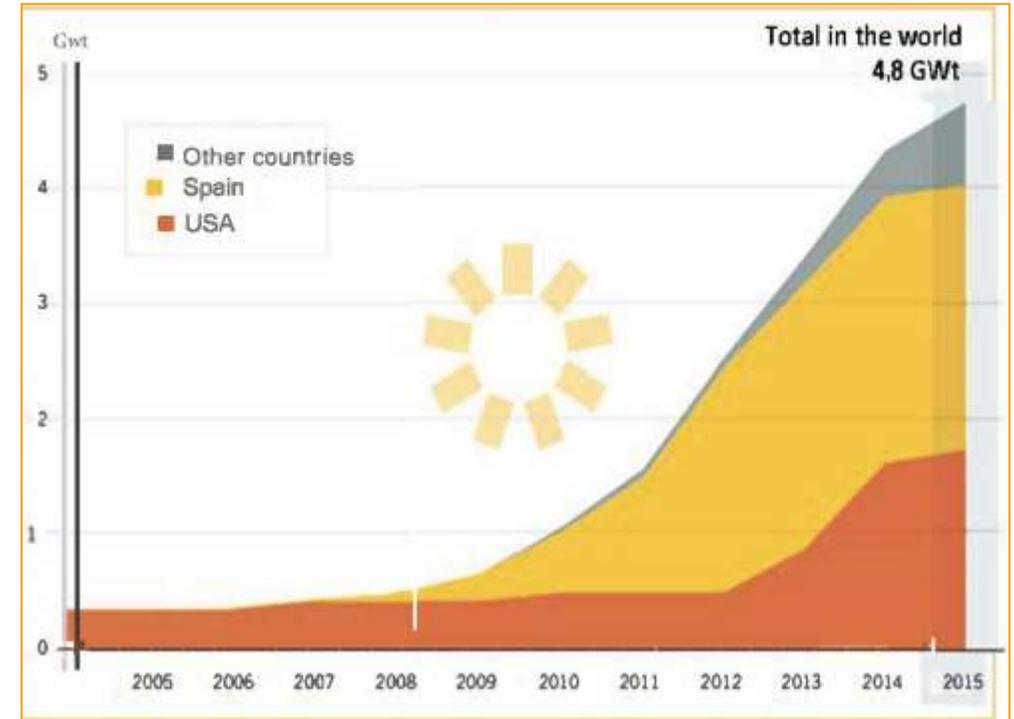


By 2030, EU countries plan to create in the RES industry:
2.8 million of job positions and **1.1% of GDP**

Solar Energy: facts and figures



Observed capacity of concentrated solar energy in the world, by countries



Capacity of the global solar energy grows in the 21st century with an average rate of **more than 50% per year**

Free energy evolution!



Today the window is not just a window.

Now it is a new energy system!

Modern renewable energy sources have the **following restrictions:**

- ✓ large area is required for installation of power equipment
- ✓ expenses for transportation and storage of received energy
- ✓ low productivity of energy sources in winter



Facade system «FREENERGY»



Facade system FREENERGY solves these problems. It converts solar energy into electrical one, conserves it and provides possibilities for a human to use it for improving the life quality

FREENERGY is an autonomous energy source for:

- ✓ illumination
- ✓ heating
- ✓ air-conditioning
- ✓ electrical devices operation
- ✓ photosynthesis process
- ✓ hydrogen and oxygen generation

The efficiency level of the facade system FREENERGY remains even in the winter, with compensation of solar activity decrease due to a favorable angle of sun rays (pretends to be 90 degrees)



How it works?

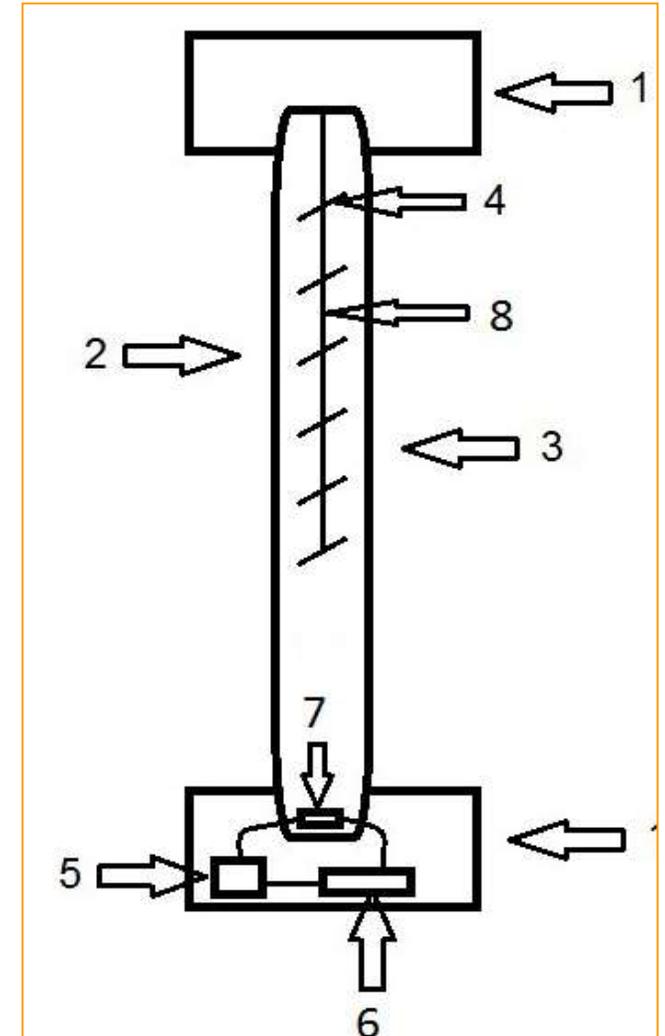


Components of the facade system FREENERGY

- Window profile with double-glazed windows (1)
- Outer glass (2)
- Interior glass (3)
- Photosynthesis element (4)
- Accumulator battery (5)
- Controller (6)
- Inventor (7)
- Device of changing the angle of impinged sun rays (8)

Operational principle of the facade system FREENERGY

1. Electric energy is generated from light, impinged on the outer glass (2).
2. The received electric energy through the inverter and controller is fed to the inner glass (3), which is heated from 1 to 60 °C.
3. Photosynthesis element is fixed in the glass unit of the window, which is in a regulated climatic environment and creates conditions for the reaction of the ATP molecule (adenosine triphosphate).
4. The chamber of double-glazed window is connected by air ducts with a window profile. Carbon dioxide, exhaled by a human, enters the chamber, after it the reaction of ATP molecule cleavage occurs. Oxygen and hydrogen return to the room.
5. Oxygen enriches the air in the room, and the released hydrogen is suitable for conserving and transportation - as an energy carrier.



Advantages and obtained IP



Key advantages of FREENERGY:

- ✓ Independent energy sources
- ✓ Sustainability
- ✓ Commercial payback during product life time
- ✓ 100% payback during beneficial use of Facade system (10 year)
- ✓ Patent protection (Russia, EU, India, USA)
- ✓ The technology is ready for implementation, protected by RF and PCT patents



Technology and the facade system itself is protected by two Russian patents

1. Patent №154157 «Window-type unit»
2. Patent №2602773 «The method of oxygen generation and the window-type unit for oxygen generation»

Global market of Facade systems



Volume of the global market of facades will reach almost **\$340 billion by 2024** (by Grand View Research data).

Trends, stimulating the growth of the global market:

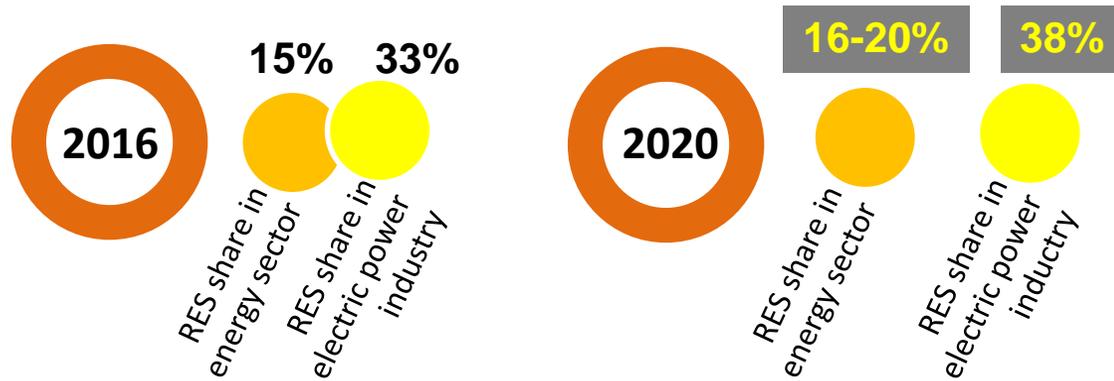
- ✓ use of environmentally friendly **translucent frame structures** all over North America and Europe
- ✓ development of technological innovations - such as **energy-efficient facade materials**. These advanced products can concentrate and use solar energy and will be widely used in many commercial and residential buildings as an additional source of generating electric energy
- ✓ **suspended eco-facades** is the fastest growing segment of the market
- ✓ basic materials are **aluminum and glass**



Germany: RES and window industry



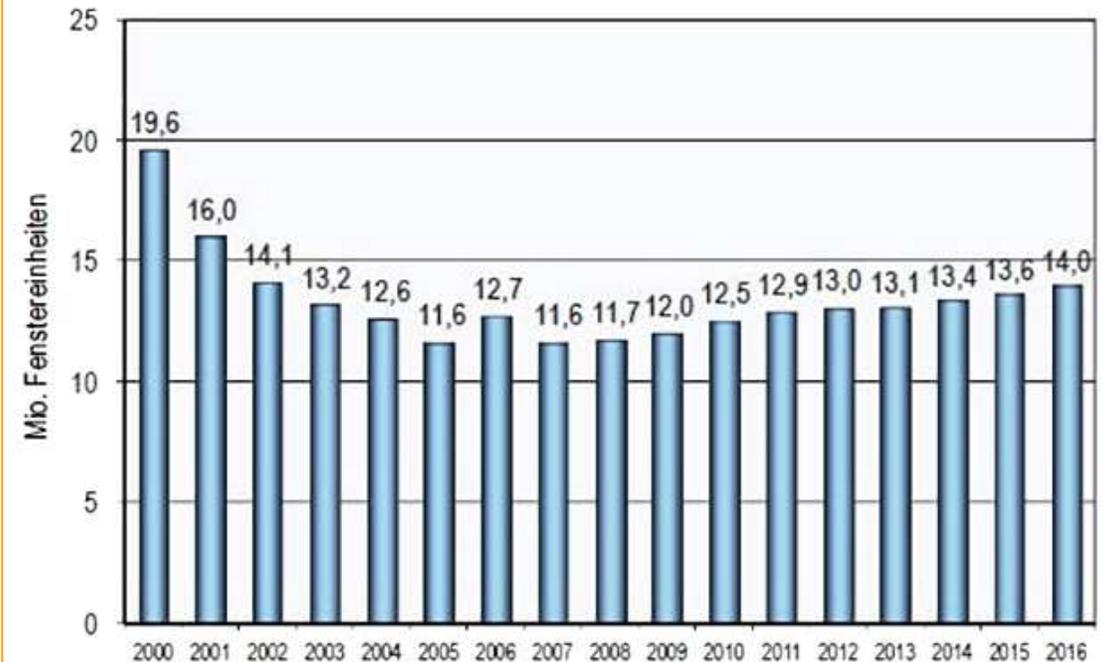
Renewable energy contribution in the energy sector in general and in the electric power industry: in 2016 and 2020



Facade and window systems market in Germany

- ✓ The average annual growth rate of markets was 4.2%; at the segment of wooden and aluminum windows, the growth was 6.4%
- ✓ Window market diversification by materials:
 - 58% - PVC windows
 - 18% - aluminum windows
 - 15% - wooden windows

Dynamics of the window market in Germany, in million window units



In Germany, there are **0,27 sq.m.** of installed translucent structures per 1 person.

Current results



Current status of the project (free-libre.com)

- ✓ Industrial samples of the facade system have been produced (located in Spain and Russia).
- ✓ Technological process is ready for implementation.
- ✓ Patenting has been done.
- ✓ Small-series production has been organized.
- ✓ Samples have been tested on the EU territory.



Partners and co-executors of the project



<http://www.uma.es/>



<http://www.solvenpvc.com/>



<https://bekar-europe.ru/>



<http://термоглас.рф/>

Our future lies with FREENERGY!



Attention to Partners:

- Completely ready technology to organize the serial production of new facade systems FREENERGY
- Opportunity to work at the new market beyond competition

Attention to Consumers:

Window system FREENERGY saves energy and time for you!

FREENERGY creates a new market of Facade systems and a completely new quality of your life!





Libre Evolucion de Energia S.L.

**Thank you
for your
attention!**

Contact person:

A. Kobtsev
kobtsev@free-libre.com

