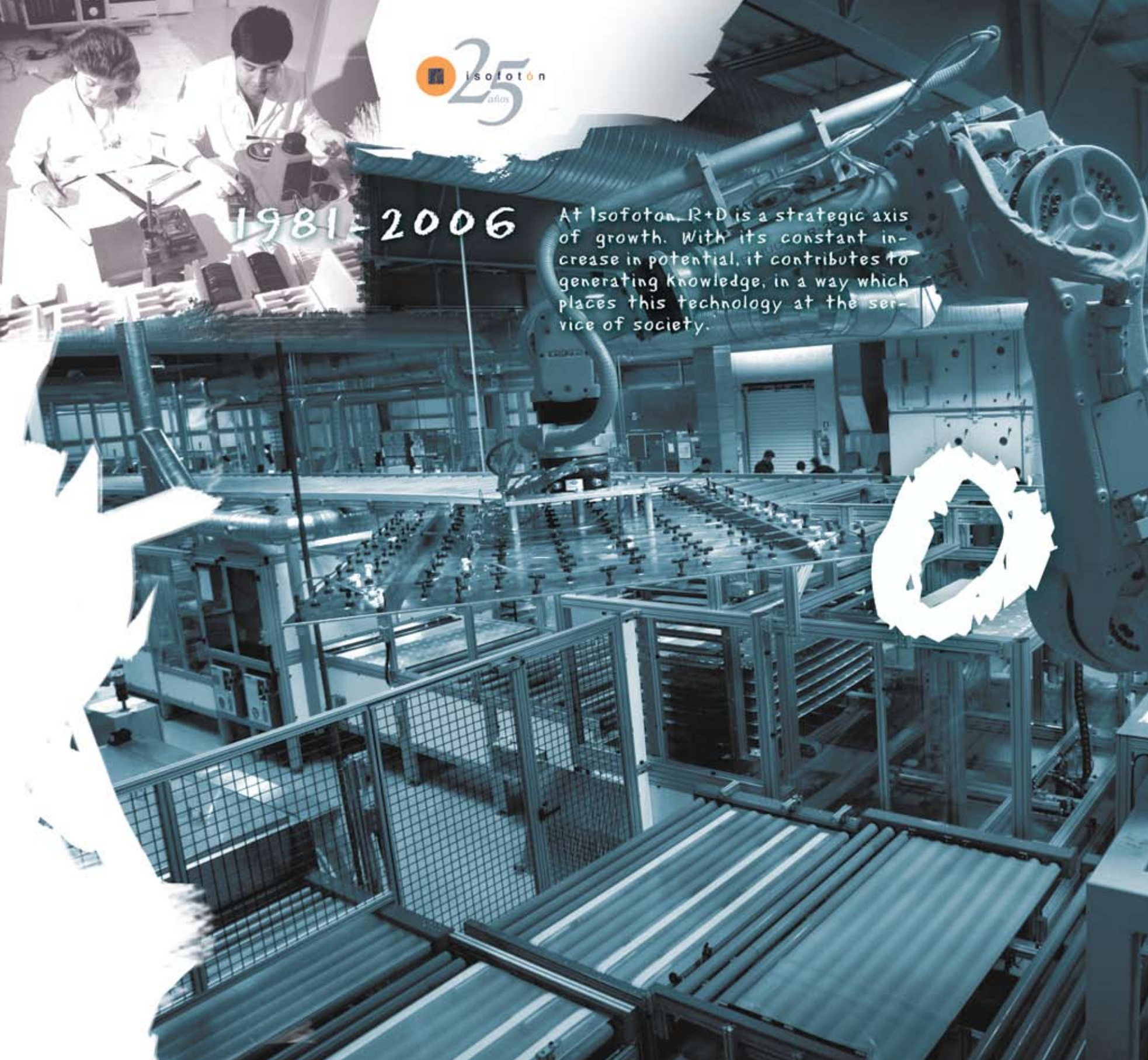
isofotón
25 años
1981-2006
At Isofoton, R+D is a strategic axis of growth. With its constant increase in potential, it contributes to generating knowledge, in a way which places this technology at the service of society.

allowed the company an advantage over its competitors and solar cell providers, promoting a tool that, at the same time, allows for the measurement of the quality of solar cells.

2.- Second packaging line.
After the achievement in the development of solar cell and concentration lens encapsulation processes (called packaging), the investment to increase productive capacities was undertaken. With this second line, and in a 7 day/24 hour production scheme, Isofoton can reach 5 MW/year in the process.

3.- Concentration tracker.
As a result of other research activity of Isofoton, which had CDTI funding, a **dual-axis solar tracking system** was developed. This system, with a precision of aim < 0.1° and a 30 m^2 open area, allows for the placement of a total of 96 photovoltaic concentration modules and reaches a power of 5 kW. This system is installed on the exteriors of Isofoton's factory with appropriate instrumentation to monitor the performance of its panels, as well as radiation and other meteorological data such as the wind velocity, the environment temperature, etc., all absolutely necessary to carry out systematic studies on the evolution of concentration modules on exteriors.

INNOVATIONS IN PRODUCTS AND APPLICATIONS 6.5

According to the UNPD (United Nations Development Program) Report about Human Development 2006, "supplying clean water, eliminating sewage water and providing drainage services are three of the bases for human development"; however, **1.1 billion people lack access to water and 2.6 billion do not have access to drainage services.**

According to the basic studies carried out for the development of this Report, the higher the poverty level is, the more costly clean water is: 20% of the poorest homes in El Salvador, Jamaica, and Nicaragua spend, on average, more than 10% of their income on water. In the United Kingdom, an expense of 3% of the family income on water is considered to be the threshold of difficult living conditions.

The authors of the Report register annually a rate of 1.8 million infant deaths caused by diharea that can be avoided by access to clean water and a lavatory; 443 million days are missed by schoolchildren due to illnesses related to water and almost 50% of the total population of developing countries suffer from, at any given time, some health problem caused by lack of water and plumbing.

Facing this situation, Isofoton thinks daily about how to contribute to the world-wide fight against these problems and in favor of the Millennium Development Goals. Therefore, Isofoton dedicates economic and human resources to the innovation of applications whose use, on a small scale, will mean a major benefit for those communities that are found in rural and isolated areas.

INNOVATING TO BETTER QUALITY OF LIFE

In 2006, Isofoton's contribution to the solutions of these problems were reinforced thanks to acquired experience and to better knowledge of the following applications:

Hybrid power plants

Hybrid systems are composed of photovoltaic modules and batteries, as well as a diesel genset, which operates during situations of high consumption or low batteries. **These systems allow rural electrification of isolated villages in a centralized manner**, ensuring better quality and a more reliable supply, as well as reducing maintenance needs carried out by a specialized technician.

The work carried out in 2006, in collaboration with the Universidad de Santiago de Compostela, to analyze the operation of batteries with the aim of guaranteeing maximum reliability and durability of the installations developed by Isofoton is remarkable. Many of these systems are found in areas with very difficult access, making it absolutely necessary to guarantee the highest possible level of performance.

Since the 1990's, Isofoton has installed 7 hybrid power plants in Senegal and Morocco. Currently, 3 new plants are under construction and 5 are in the planning stages.

Pumping

Until now, Photovoltaic Pumping Systems have been considered to be a solution to the shortage of drinking water in rural areas, located far from the electrical network. Isofoton's experience in this field has been developed primarily in African and Asian countries, having installed over 150 systems.

The company is researching new applications of this technology, focused on supply for large consumption by **high powered pumps with solar tracking structures**. The idea of adapting Solar Pumping to drip irrigation facilities is also under study through two pilot facilities, with the aim of guaranteeing efficient consumption and water conservation. The final monitoring of the facilities will allow supervision and control of the work carried out, as well as further study of the obtained results.

Reverse osmosis

Isofoton is actively researching the possibility of **using salt water through desalination,** in regions where fresh water is scarce thereby avoiding the over-exploitation of aquifers.

Desalination consists of eliminating the saline component of water. It can be achieved through various methods: electrodialysis, osmosis, distillation, freezing, etc. However, reverse osmosis, due to the simplicity, efficiency, and economic feasibility of the process, is currently the most developed technique.

Isofoton, in collaboration with the Technological Institute of the Canary Islands (ITC), and VEOLIA Water Systems, has developed a pilot plant, supported in its entirety by Photovoltaic Solar Energy, completely minimizing the use of batteries. This prototype is housed on the premises of the ITC, where it is subject to operation and durability tests. In 2007, the necessary results will be obtained to validate its design and execution for its future commercialization.

Innovations in Building Integration Photovoltaics

The principal points in the innovations of architecture developed in 2006 were:

Development of lamination of special glass-glass photovoltaic modules.

The design of these modules was worked on in collaboration with the Vidur-Solar company. The main characteristic of the modules is their composition of a **double layer of glass** in which the photovoltaic cell is encapsulated.

The objective is to offer a high technology constructive element that substitutes other conventional elements of construction, assuming the same functions with respect to safety, solar protection, thermal and acoustic isolation, in addition to incorporating an innovative, esthetic, and highly ecological component. The characteristics of these glasses allow for their use in different applications where it is necessary to unite function and esthetic, for example in exterior façades, surface treatments of the façades, curtain walls, skylights, or crystallized pergolas.

Design and development of photovoltaic LED streetlamp.

The photovoltaic LED streetlamp, designed and developed by Isofoton, has the principal objective of supplying autonomous light to areas that are isolated or far from the public network. It will primarily be used in African, Asian, or Latin American developing countries, for which it needs to be an **efficient, resistant, and economic product.** LED (Lighting Emiting Diode) technology has been used for its physical resistance, its low energy consumption, and its great durability (60,000 hours, 12 times that of a traditional lamp).

The support structure was designed to be flexible and multifunctional (motorways, plazas, sidewalks…), with standard manufacturing technology that allows for the parts to be produced in any country.

This joint experience with the Departments of Architecture, Product, Engineering, and Installations is paving the way for the design of other elements, adapting different accessories like billboards, based on the same lighting and manufacturing technology, with the aim of achieving a range of street features with Isofoton's own identity.

Prototype of glass-glass module with Isofoton cells

Prototype of LED streetlamp