

Stained Glass Solar Windows for the Swiss Tech Convention Center

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Abstract: As a world first, 300 m² of dye-sensitized solar cells will be integrated into the facade of the EPFL's Convention Center. This prototype will constitute the first application of such technology to a public building. The translucent panels are constructed and assembled by local small and medium businesses and make use of an invention by EPFL researcher Michael Grätzel. This project is embedded within the framework of the partnership established in 2009 between EPFL and Romande Energie – whose aim is to create one of the largest solar energy parks in Switzerland.

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The west facade of EPFL's future Convention Center, currently under construction, will certainly be an eye-catcher. The silk-screened glass blinds that had been initially planned for the building will be replaced with translucent and colored photovoltaic panels, also known as 'Grätzel cells' after their inventor. In a partnership between the EPFL and Romande Energie, this decision was made with the collaboration of the building architects, the Center owner and the constructors.

The new element of the facade will be manufactured by Soloronix (Aubonne, Switzerland), the first company to acquire the rights to the EPFL patent license in 1994. The SME will assemble 1500 mod-

ules of 35 × 50 cm on a surface of 300 m². Thanks to a recent technological breakthrough and after a sequence of intensive tests, the company is confident that a sufficient level of reliability has been reached that will enable them to move from lab to reality. "I am very pleased to see this technology used in a major architectural project", said Michael Grätzel. "This is an important step towards a large-scale distribution of dye-sensitized solar cells, whose principle is based on plant photosynthesis", explained the researcher.

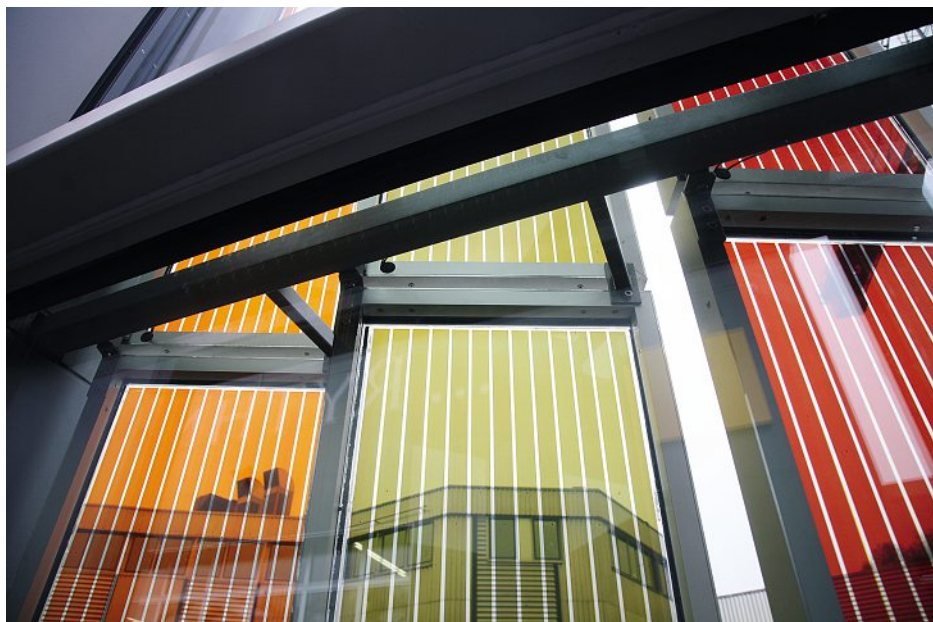
A Work of Art and Architecture

Unlike opaque solar cells made of silicon, Grätzel units are transparent. The cells at the Convention Center will exhibit shades of red and orange, as designed by the artist Catherine Bolle from Lausanne. They will simultaneously accomplish two

functions: protection from solar radiation on the glass facade so as to regulate the temperature inside the building and the production of renewable electricity.

A Step towards Industrialization

The production of electricity, estimated at 8,000 kilowatt hours (kWh) per year, only represents a minor part of the overall building consumption. In fact, these types of sensors are less efficient than silicon cells. However, they perform well with diffuse light. In the case of the Convention Center, the cells will be placed vertically facing west so their use will be optimized. Moreover, the industrialization of this technology predicts a good cost/efficiency ratio, as the manufacturing process does not require high temperatures – which are energy consuming – or rare materials.



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“What we are doing with this Convention Center is a display of technology, a platform intended to draw attention to a remarkable device invented at our labs, to full-scale test this technology and to demonstrate its significant architectural potential”, said Francis-Luc Perret, Vice President for Planning and Logistics at EPFL.

Romande Energie's Commitment to Supporting R&D

The construction of this facade element in the fall of 2013 is made possible by the commitment of Romande Energie, whose investment has covered the extra charges beyond the original budget. “By participating in this project, as well as in multiple research programs, our company supports the emergence of innovative technologies in areas related to our domain, particularly in the generation of electricity based on novel renewable sources”, said Pierre-Alain Urech, CEO of Romande Energie. The electricity provider has already installed more than 15,000 m² of panels on EPFL's rooftops since the beginning of the solar energy park project.

About the Swiss Tech Convention Center (www.tstcc.ch)

To be inaugurated in Spring 2014, the Swiss Tech Convention Center owes its design to Richter-Dahl Rocha and Associates Architects in Lausanne. The Grätzel solar shades project also relies on the involvement of Credit Suisse, which owns the building through Credit Suisse Real Estate Fund Living Plus and Credit Suisse Real Estate Fund Hospitality, and of the general contractor HRS Real Estate SA in Crissier.

About Romande Energie (www.romande-energie.ch)

The Romande Energie Group is the first provider of electricity in western Switzerland. Through Romande Energie Commerce, it supplies energy to over 300,000 end customers (representing a population of more than 500,000 people) that spread over 300 municipalities in the cantons of Vaud, Valais, Fribourg and Geneva. Its core businesses are the production, distribution and commercialization of electricity. The priorities of the Group are: to offer its customers high quality services, to guarantee a reliable, sustainable

and competitive supply of electricity, to develop its own production by investing primarily in new renewable energies and to promote innovative solutions in the field of energy efficiency.

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