Solar energy for the environment oslo

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The solar research at IFE is divided in two departments, the Department of Solar Energy Materials and Technology and the Department of Solar Power Systems. More than 35 researchers and engineers works full-time with solar energy at IFE, and their research fields include both the sustainable production of silicon for solar cells, development of new types of solar cells and modules, large-scale solar power plants and data analysis, and integrated solar energy such as floating PV, PV in combination with other land area use, and PV integrated in buildings and infrastructure.

IFE offers several services in combination with our PV module outdoor test facility, the PV module characterization and testing laboratory and the solar cell laboratory.

The work with solar cell technology also includes the optimization of solar cells with respect to optical reflection and colours, as well as other energy materials and smart windows. Several types of innovative PV modules and solar cells are constantly being developed for multiple purposes, often in cooperation with Norwegian companies.Solar Cell Technology

To sufficiently manage the data flow from such large facilities, modern digital tools, advanced data analysis and machine learning are crucial. At IFE, the Department of Solar Power Systems has a group of specialists working with leading Norwegian companies within this field. The group contributes to securing suitable designs and modelling of the power plants, investigating the energy yield, degradation, fault detection and reliability, as well as hybrid solar power plants which combined solar power generation with other types of renewable energy generation.Solar Power plants

At IFE, the Department of Solar Power Systems has a subgroup dedicated to research on floating PV. This group works with development of specific individual technological solution, assessment of performance and reliability of floating PV through laboratory tests and in the field, and increasing the energy yield, optimizing maintenance, and mechanical and thermal influences on the floating solar cells during use. IFE collaborates with several Norwegian and international companies developing solutions for floating PV.

Due to increasing demands on land use, the combination of solar energy with already occupied areas is becoming more attractive. This attraction increases with the decreasing costs of solar cells, and the combination of solar energy with other structures provides an added value to the structure. PV panels can be installed either as separate structures on already existing constructions such as roofs, so-called applied PV, or as integrated components in the construction, such as roofing material or fa?ade components.

Integrated solar energy in buildings and infrastructure is a field of research with great progress and advancement in Europe and Norway. Building-integrated PV, or BIPV, replaces a construction material with a multifunctional PV panel which covers the functionality of the building envelope as well as it produces

energy. This replacement saves the cost of the original construction material.

In recent years the price of solar cells has fallen so dramatically that more and more people are now looking to invest in solar panels. These can be installed either as free-standing structures on roofs or as integrated components of construction modules such as roof slates or facade panels.

Integrated solar poweraresolar panels that are combined and put together with constructions that already have an additional function, like a building, road, sports arena etc tegrated solar thus represents an additional value of the construction and will,in many cases,replace a construction component that can be alleviated. Typical construction components that can be replaced by solar components are roofing, wall claddings, railings and windshields,sunand rain screens etc.

Oslo has fleets of electric mass public transit throughout the city - electric trams, buses, and ferries - that are powered by electricity from a municipal grid fed almost entirely by renewable energy (RE).