Designer solar: New tool unlocks smart solar design

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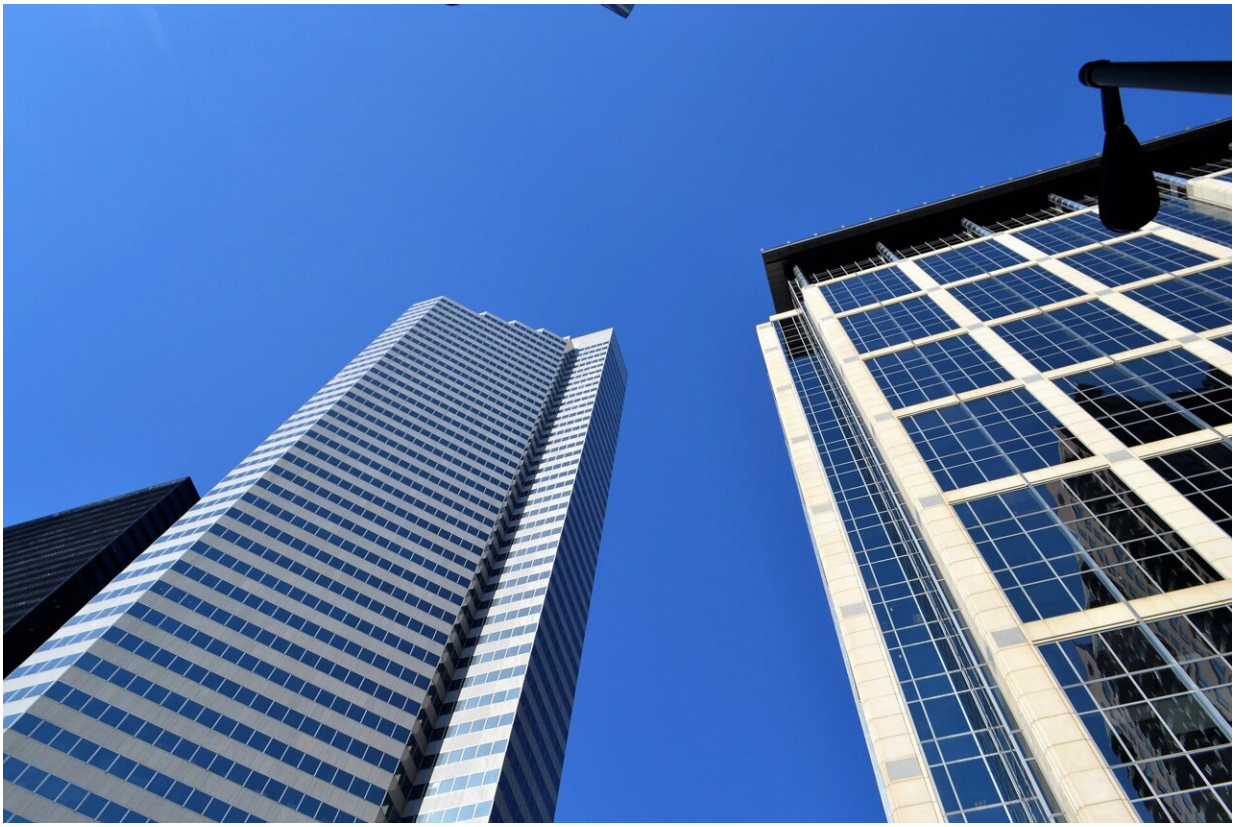

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Designing buildings with solar cleverly incorporated into the design has just become easier, thanks to software developed at RMIT University.

Building-integrated photovoltaics, or BIPV, are building features such as roof tiles, cladding and windows that double as solar panels.

Depending on the dwelling, BIPVs can cover a greater area of a building, generating solar energy from different angles. They also look smart and can be customized.

Despite the potential of BIPVs, conventional roof-mounted panels continue to account for the lion's share of new installations in Australia due to the extra complexity in predicting performance and sourcing BIPV technology.

Now a team at RMIT has created software to help architects and engineers incorporate, source and cost BIPV in a building's conceptual design phase.

The software is the first of its kind to be designed using Australian data.

Project lead Associate Professor Rebecca Yang from RMIT's Solar Energy Application Group said she hoped the tool, called BIPV Enabler, would help make buildings greener.

"This is the perfect solution for building designers and developers looking to select the right solar option to suit their design," said Yang, who is the director of the Australian PV Institute and driving the BIPV Alliance.

"We're making integrated-solar a more attractive option to developers, slicing the time it would normally take to research and implement incognito solar devices.

"This isn't just for new buildings either. Those looking to retro fit integrated solar into existing buildings will benefit too."

The tool integrates product, regulation, technical, economic and construction data to create 3D models and detailed lifecycle simulations tailored to each building's planned location.

It comes as the construction of Australia's first office tower to be fully clad in solar panels was announced last year.

For architects like Nic Bao, BIPV Enabler is set to help bridge the gap between BIPV technology and architectural design.

Bao, a Lecturer in Architecture at RMIT, said having a tool to effortlessly incorporate factors such as climate, building code and materials would make solar-savvy design easier.

"There are so many technical factors to consider when integrating BIPV into a design that it hadn't been a popular choice, which was a missed opportunity," he said.

"Making BIPV design more accessible promotes sustainable development of energy-efficient buildings, while providing opportunities for low-carbon architecture."

The other challenge faced by designers and developers using integrated solar is choosing and sourcing materials.

BIPV Enabler helps with both, boasting Australia's first photovoltaic product database where Australian suppliers can be easily identified.

Among the tool's features are maps, a 3D shape library, solar visualizations, hourly weather data and pricing information for materials and feed-in tariffs.

Yang said BIPV Enabler also worked with computer-aided design

programs and could be scaled and customized to incorporate other open-source datasets to suit changing needs.

"We hope to see more buildings capable of generating solar electricity, while maintaining good design standards—a win for the planet and aesthetics," Yang said.

Provided by RMIT University