



ENERGY INNOVATION FORUM

Crowdsourcing a Virtual Solar Grid with a “Solar Minecraft”

Charles Xie, PhD

Concord Consortium



ENERGY INNOVATION FORUM

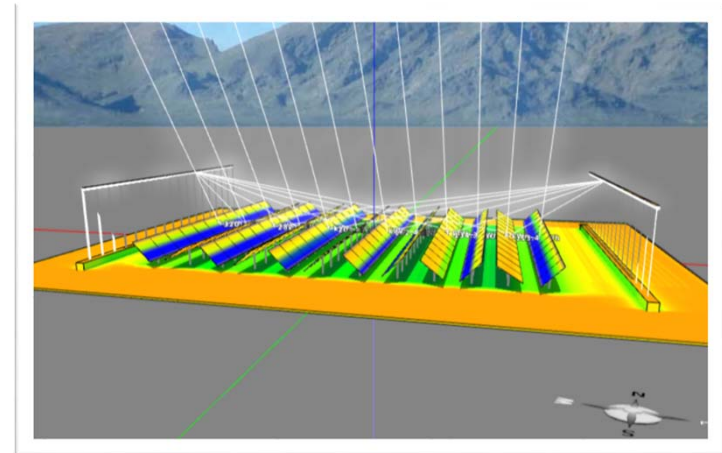
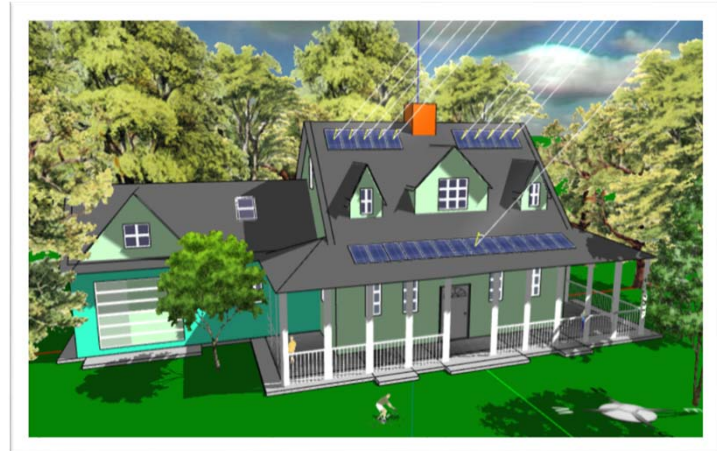
COMPANY ORIGINS

Who are we?

A group of researchers, developers, and educators focused on engineering computation and education

What problem are we trying to solve?

Among the existing methods for large-scale computational assessment of solar potential (*constant-value, manual selection, and GIS-based* as per Melius, et al., NREL, 2013), site-by-site manual selection has the finest resolution and highest accuracy but is too time-consuming to be scalable (Gagnon, et al., NREL, 2016).

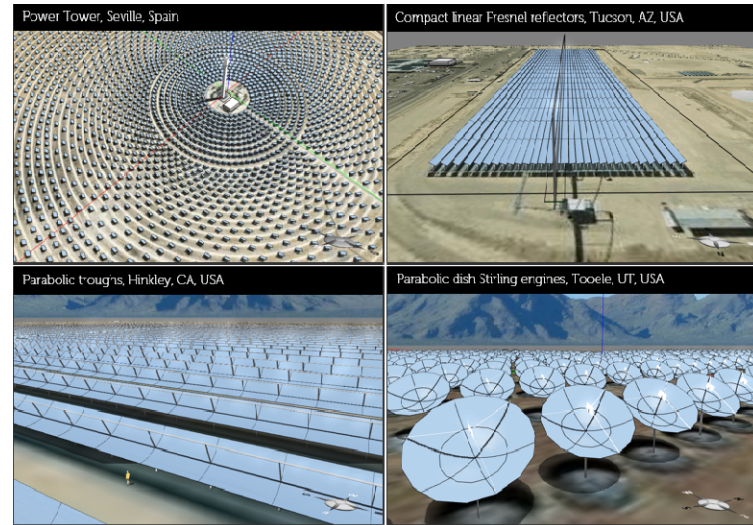


ENERGY INNOVATION FORUM

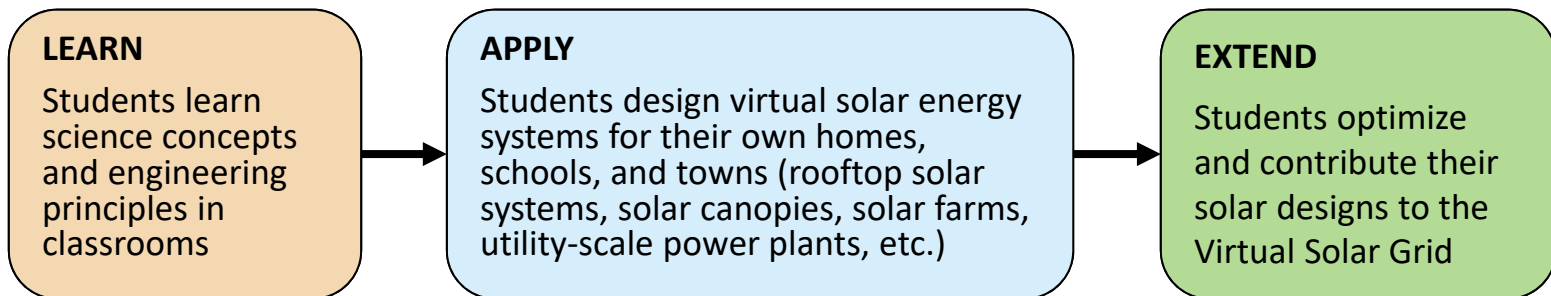
KEY PRODUCTS/TECHNOLOGIES

A Crowdsourcing Solution

- Energy3D: a “Minecraft-like one-stop-shop” CAD program for simulating and designing all types of solar energy systems (photovoltaic, concentrated solar power, passive solar, etc.) for almost anywhere in the world
- A crowdsourcing model to create a Virtual Solar Grid based on integrating STEM education and citizen science



Four types of CSP plants modeled by Energy3D

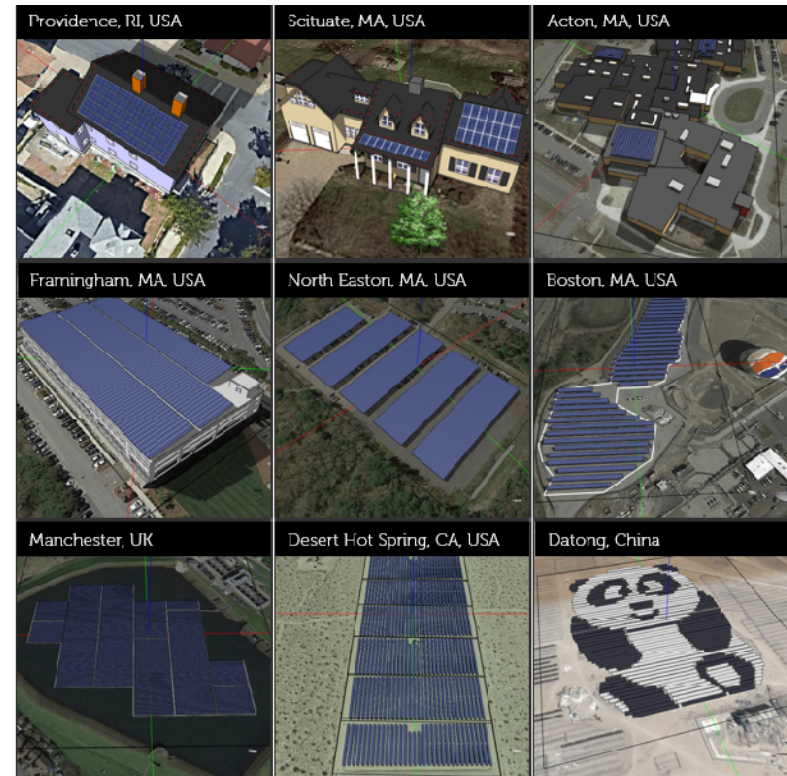


ENERGY INNOVATION FORUM

KEY PRODUCTS/TECHNOLOGIES

R&D plan in the next two years

- Create artificial intelligence (AI) to guide engineering design (quality assurance for submitted models)
- Develop time-dependent, multiscale simulation to predict minute-by-minute outputs from modules (micro) to grids (macro)
- Make this project as engaging or necessary to students as robotics or Minecraft (integration with education standards and practices)



Energy3D turns Google Maps into “Solar Canvas”

ENERGY INNOVATION FORUM

COMMERCIAL IMPACT

What will be the impact of the technology once it is commercialized?

- Energy research (ultra-fine-grained computational model)
- Solar companies (leads?)
- RE100 companies (sponsorships?)
- STEM education (especially engineering education)



600+ regions supported worldwide

ENERGY INNOVATION FORUM

NEXT STEPS AND NEEDS

What are we looking for?

- Funders
- Partners
- Developers
- Teachers

Current funders:

- National Science Foundation
- General Motors

