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SCEP
STATE & COMMUNITY ENERGY PROGRAMS

System Advisor Model (SAM) and PVWatts®

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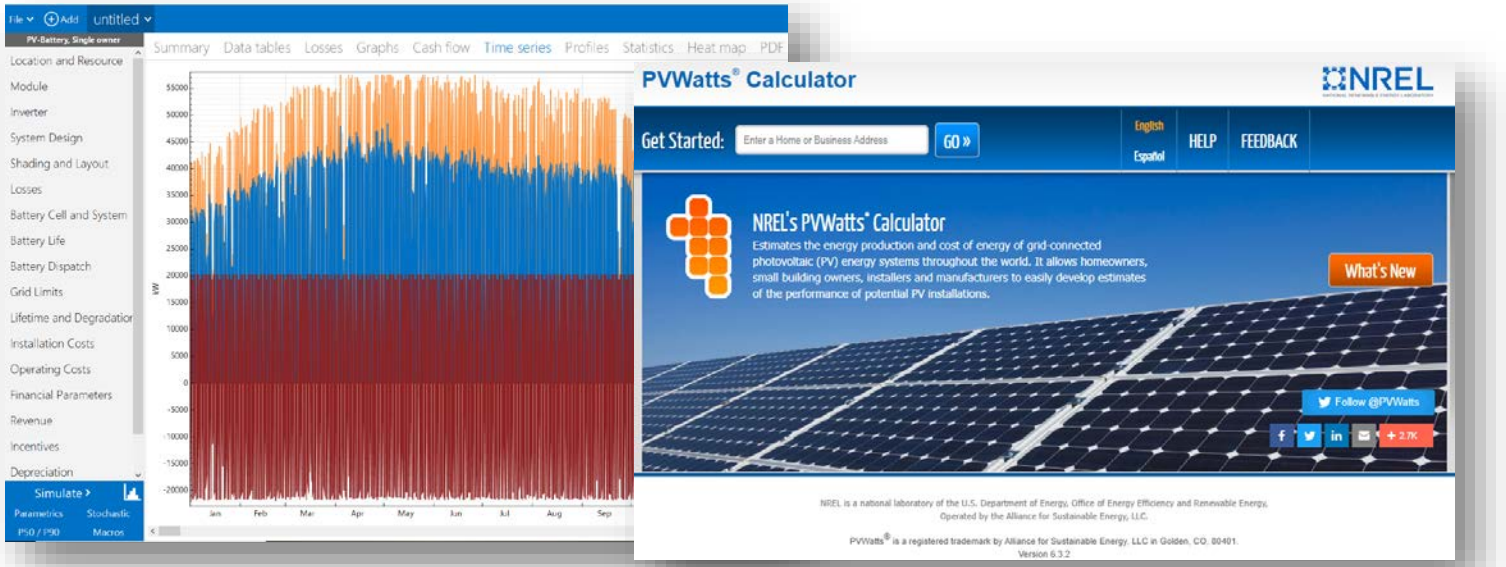
Photo by Dennis Schroeder, NREL 55200

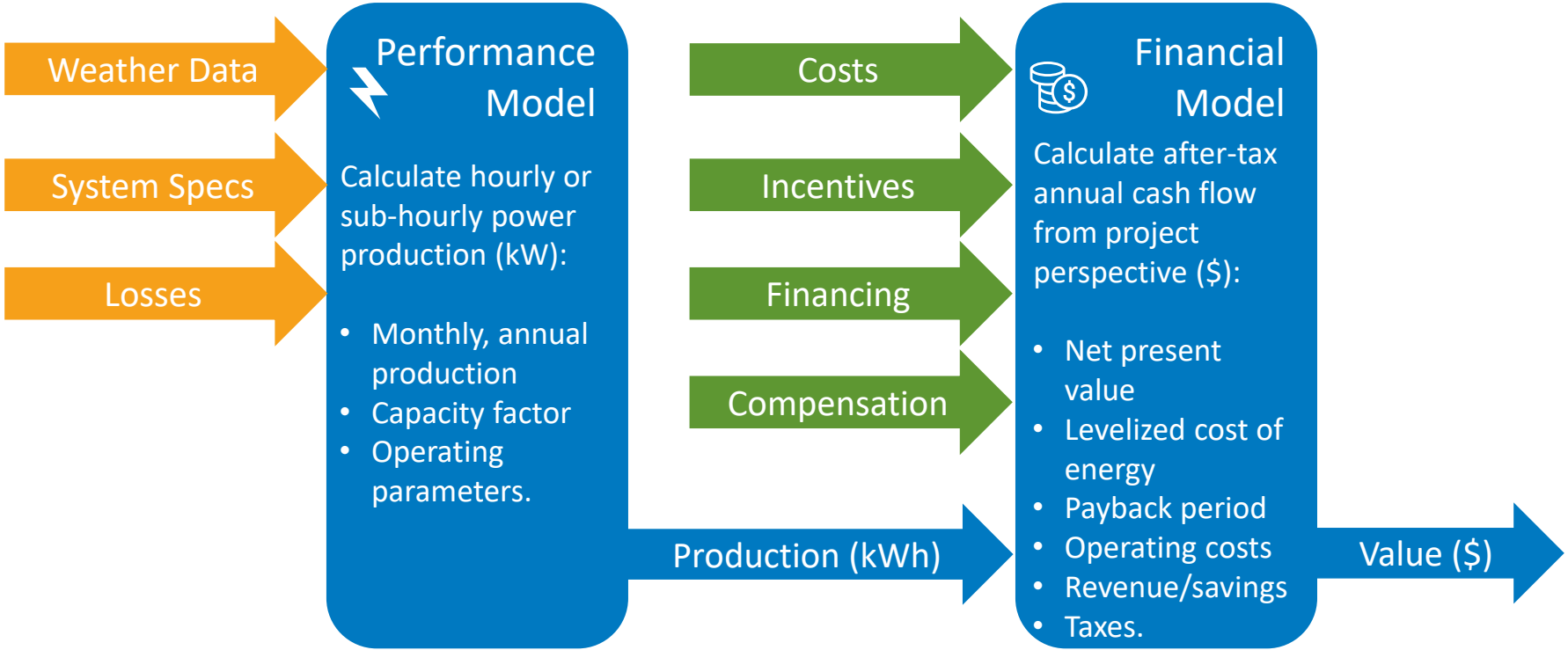
System Advisor Model (SAM) and PVWatts

Free software that enable detailed performance and financial analysis for renewable energy systems.



http://sam.nrel.gov/download
https://pvwatts.nrel.gov

Model Structure



Technologies

- Photovoltaic
- Energy storage:
  - Electric battery
  - Electric thermal storage.
- Concentrating solar power
- Industrial process heat
- Marine energy
- Wind power
- Fuel cell
- Geothermal power
- Solar water heating
- Biomass combustion
- Generic system.

Financial Models

- Power purchase agreements:
  - Single owner
  - Partnership flips
  - Sale leaseback.
- Residential
- Commercial
- Third party ownership
- Merchant plant
- Community solar
- Simple levelized cost of energy calculator.

Who Uses SAM? Why?

- **Lawmakers and Utilities:**
  … to study how a policy would affect the economics of a typical system
  … to analyze different types of utility rate structures for renewables.
- **Developers and Engineers:**
  … to compare technologies, sites, or configurations
  … to estimate the levelized cost of energy for a system.
- **Researchers:**
  … to examine how an innovative concept might be able to lower the levelized cost of energy
  … to estimate the technical potential of a technology in a region.
- **Students:**
  … to learn about renewable energy
  … to explore financing structures for renewable energy.

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Live PVWatts and SAM Demo
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Other Resources

- Check out the SAM website (sam.nrel.gov):
  - Weather data information
  - Technology model documentation (PV, battery, wind, & more!)
  - Videos, costs, publications, and validation by technology
  - Events and webinars
  - Financial model documentation
  - Support forum.
- PySAM Python wrapper and SDK for other languages
- Source Code (SAM is open source on GitHub)
- Example files, example scripts, component libraries, and more.

Thank you! Questions?

www.nrel.gov

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