Roof Savings Calculator
Fact Sheet

**Technology Summary**
Roof Savings Calculator (RSC) is a user-friendly tool for reporting whole-building energy and cost savings as a result of using a cool roof. Developed over several years through a collaboration between Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory, RSC replaces cool roof toolkits (i.e., company-specific estimates for roofs and previous calculators that provided different varying estimates of cool roof savings). RSC was developed to provide an industry-consensus standard for savings of modern roof and attic technologies.

RSC uses DOE-2.1E for fast, whole-building energy simulations and integrates AtticSim, an ASTM standard, for advanced modeling of the roof assembly. AtticSim captures radiative heat transfer in the roof assembly with high-fidelity physics and determines heat flow through the roof and attic assembly to the attic floor. This information is then exchanged at each time-step of simulation to the DOE-2.1E whole-building simulation model to determine energy and cost savings from the HVAC unit.

RSC supports four types of buildings: residential, office, warehouse, and retail. A total of 17 questions need to be answered in the tool. Parameters include location, building type, area (ft²), and number of floors, along with specific information on the roof material and construction. The user can modify levels of insulation, roof solar reflectance (aged) and thermal emittance (aged) values, above sheathing ventilation, radiant barrier, location of ducts, and details of the building’s heating and cooling system.

An annual simulation of hour-by-hour performance is calculated based on building properties and weather for the selected location. Processing of the input data takes approximately one minute to show the energy and cost impacts on a building with an existing roof system compared to a new roof or attic. The annual energy savings are reported based on heating and cooling load reduction.

**Advantages**
- Fast processing (approximately one minute) of the input data
- Reliable, accurate, and credible third-party estimate of roofing and attic savings
- Cost savings comparisons for a variety of roofing options and materials
- Supports both commercial and residential buildings
- Incorporates additional roofing materials and coatings and insulation
- Over 30,000 model results currently available; tested with over 3,000,000 simulations
- An estimated energy savings of up to $500 per year for residential buildings (commercial buildings could save much more)

**Potential Applications**
- Roofing insulation, coating, materials, and energy cost-saving comparisons
- Commercial and residential roofing contractor cost-savings tool
- Estimation of retrofit/renovation energy savings

**Patent**

**Inventor Point of Contact**
Joshua New, Ph.D.
Energy & Transportation Science Division
Oak Ridge National Laboratory

**Licensing Contact**
David L. Sims
Technology Commercialization Manager
Technology Commercialization
UT-Battelle, LLC Oak Ridge National Laboratory
Office Phone: 865.241.3808
Email: simstdl@ornl.gov

To view this and other ORNL inventions, visit ORNL Partnerships at http://www.ornl.gov/connect-with-ornl/for-industry/partnerships/technology-licensing/available-technologies

ORNL 2016-G0098S/tcc
07.2016