Thin-Film Solar Cell Manufacturing B-Roll

Scene-by-Scene Description

Get the facts behind the footage available on the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) B-Roll Web site at **eere.energy.gov/news/b_roll.cfm**.

Video Title: Solar Panel Manufacturing B-Roll
Video Only/No Audio
Location: Tucson, Arizona
Shoot Date: July 8, 2010
Total Running Time: 6:00

Scene 1: 00:05: Screen-printing conductive material onto laminated material at solar cell manufacturing facility. Thin-film CIGS (cadmium, indium, copper, and selenium) solar photovoltaic (PV) cells are produced using a roll-to-roll manufacturing process similar to the one used to print paper.

Scene 2: 01:32: Inspecting metal material for lamination.

Scene 3: 02:03: Lamination machines on the factory floor.

Scene 4: 02:28: Vacuum press. In the vacuum press, conductive materials are heated to boiling, and the roll of material is run through the chamber. Vapors from the boiling chemicals condense onto the roll of material.

Scene 5: 02:59: Splicing operation. The rolls are split into segments, or solar cells.

Scene 6: 03:55: Robotic assembly of solar panels. Segments are joined to create full panels.

Scene 7: 04:59: Retail portable solar product sample. Thin-film PV technologies reduce the amount of material required in creating a solar cell as well as the weight of the finished product. This equates to a flexible, lightweight product that can offer power away from the solar grid—with great potential for camping, hiking, military, and other use.

Scene 8: 05:29: Building exterior with solar array. Thin-film devices are less expensive than commonly used crystalline silicon solar panels.

Learn More about Thin-Film Photovoltaics

Thin-film silicon solar photovoltaic (PV) cells have grown popular in recent years due to their low cost, great flexibility, light weight, and ease of integration compared to wafer silicon cells. Created by the National

Renewable Energy Laboratory (NREL), the CIGS thin-film cell involves applying a thin film of semiconductor material to an inexpensive substrate such as glass, plastic, flexible foil, or stainless steel. NREL created the cell's semiconductor material from alloys of cadmium, indium, copper, and selenium (CIGS). An NREL team achieved a conversion efficiency of 19.9 percent with this technology in 2008.

Through the Photovoltaic Technology Incubator project, DOE's Solar Energy Technologies Program (SETP) is aggressively funding a diverse set of PV technologies—such as the CIGS cell—that have potential application in a variety of markets. To learn more about the project, visit **eere.energy.gov/solar/pv_incubator.html**.