STEMonstrations

SOLAR ENERGY

1
00:00:14,210 --> 00:00:18,000
Hi! Welcome aboard the
International Space Station

2
00:00:18,000 --> 00:00:21,510
I'm astronaut Ricky Arnold and I'm
currently at one of our human research

3
00:00:21,510 --> 00:00:26,910
facilities on ISS where you can see
centrifuges laptops and other scientific

4
00:00:26,910 --> 00:00:31,349
equipment across from me is another one
ease experiment racks where you can see

5
00:00:31,349 --> 00:00:36,540
ultrasound imaging more laptops cameras
other equipment all stuff that requires

6
00:00:36,540 --> 00:00:41,190
electrical power in fact we have so much
equipment for science and life support

7
00:00:41,190 --> 00:00:45,380
that our electrical system has about
eight miles or 13 kilometers of wiring

8
00:00:45,380 --> 00:00:52,460
to make it all work. So where does this
energy come from? Let's have a look.

9
00:00:52,469 --> 00:00:55,340
From here in the cupola and through other
windows you can easily see the solar

10
00:00:55,350 --> 00:01:00,539
rays soaking in the sunlight. They are
massive. These four solar arrays are made

11
00:01:00,539 --> 00:01:05,040
of solar cell which are purified chunks
of the element silicon. Together the

12
00:01:05,040 --> 00:01:10,170
solar arrays contain a total of 262,400
solar cells and cover an area of

13
00:01:10,170 --> 00:01:15,270
about 27,000 square feet, more than half
the area of a football field. That's huge!

14
00:01:15,270 --> 00:01:20,009
When the station is in sunlight the
solar arrays produce about 60 percent

15
00:01:20,009 --> 00:01:25,080
more power than we actually need during
the daytime. That extra power goes

16
00:01:25,080 --> 00:01:29,220
directly to charging our lithium-ion
batteries. Now those batteries are

17
00:01:29,220 --> 00:01:33,540
essential because they provide the power
we need during the 16 night times we

18
00:01:33,540 --> 00:01:38,340
have per day here on the space station.
The energy our solar arrays can produce

19
00:01:38,340 --> 00:01:42,840
is enough to power 40 homes and we can
maximize the power we generate by

20
00:01:42,840 --> 00:01:46,890
rotating their arrays and two axes one
like a windmill to track the Sun through

21
00:01:46,890 --> 00:01:51,119
the course of the day the other the
track the sun's inclination or its angle

22
00:01:51,119 --> 00:01:56,640
in the sky. The space stations electrical
power system uses direct current to

23
00:01:56,640 --> 00:02:00,600
provide energy for our laptops lights
water recovery system and science

24
00:02:00,600 --> 00:02:04,890
experiments.
Thanks for coming aboard today! Now back