



Integrity Research Institute

RENEWABLE ENERGY & SUSTAINABLE DEVELOPMENT

***“BREAKTHROUGH ENERGY
TECHNOLOGIES”***
DERIVED FROM NEW PARADIGM SCIENCE

ICSG III APRIL 10-11, 2022
THOMAS F. VALONE, PHD, PE
INTEGRITY RESEARCH INSTITUTE
BELTSVILLE MD
USA

NEW PARADIGM SCIENCE FOR ENERGY

- **Motivation** for researching new energy: global warming adding 1°C every 20 years due to CO₂ buildup in the air which **traps heat** (See TinyURL.com/CO2HEAT)
- **Resources** for food and drink – 11 billion people expected by 2100?
- Since 1950, **Population** has tripled (3x)
- **Carbon Emissions** have quadrupled (4x)
- **Energy Demand** or Consumption has quintupled (5x)
- **We need new energy developments to save humanity**

Earth's 400,000 Year Paleoclimatology

credit: Dr. Jim Hansen, NASA Goddard Inst. for Space Studies

Atmospheric CO₂

Avg. Earth Temperature

Sea Level

CO₂ and the "Ornery Climate Beast"

How might today's human-caused increases in atmospheric concentrations of carbon dioxide and other greenhouse gases change the planet? The past provides clues. Geological records show that in the past 400,000

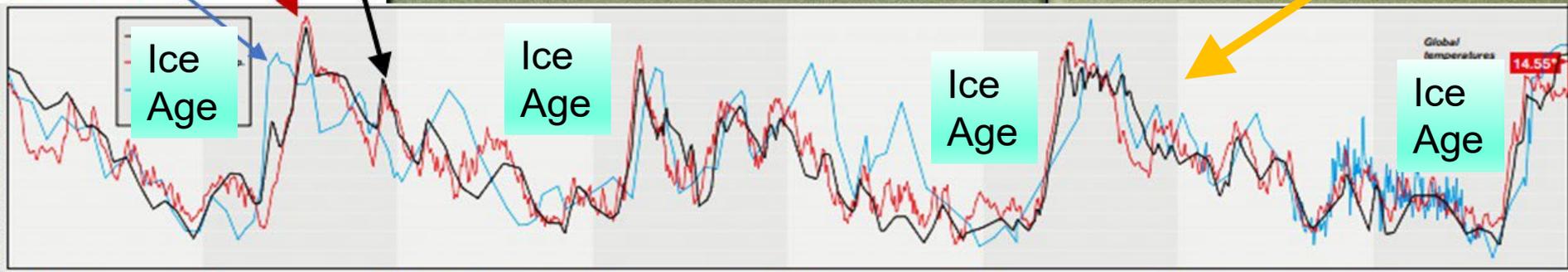
years, atmospheric concentrations of carbon dioxide, average Earth temperature, and sea levels have risen and fallen roughly in tandem, in 100,000-year cycles paced by slight oscillations in Earth's orbit. These oscillations

affect the distribution of sunlight, hardly affecting the amount reaching Earth; yet, scientists have found that to set in motion ice ages, and trigger the last changes in sea level. What's coming next? Carbon dioxide—the number one greenhouse gas—has

much more power to affect Earth's temperature than the orbital changes. The most recent 100,000 years, human activity has boosted atmospheric concentrations by 30 percent. Scientists expect that if we continue to increase greenhouse-gas emissions, temperatures will rise between 2 and 3 °C this century, making

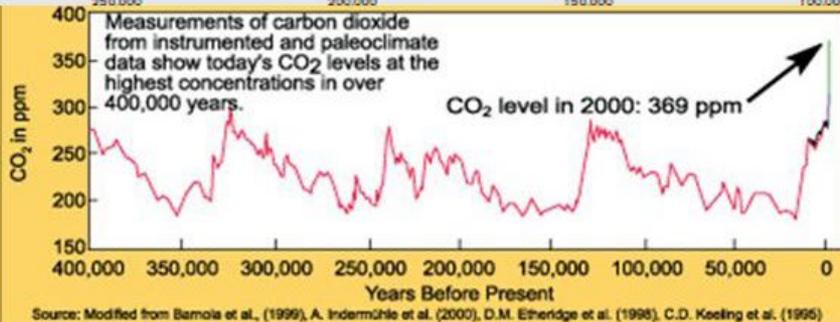
Earth as warm as it was three million years ago, when seas were between 5 and 35 meters higher. The part of the projection that shows the sea level rise is based on the best available data. He has concluded that his results closely match the measured temperature shown here. DAVID TALBOT

Hansen Graph



NOAA states, "CO₂ levels are at the highest concentrations in over 400,000 years" →

On right is the same CO₂ data from ncdc. noaa.gov



MIT's *Technology Review* July/August, 2006

Composite of the past 400,000 year earth history proves **CO₂, world temp, and sea level** are inextricably correlatively linked starting from early 20th century at 290 ppm

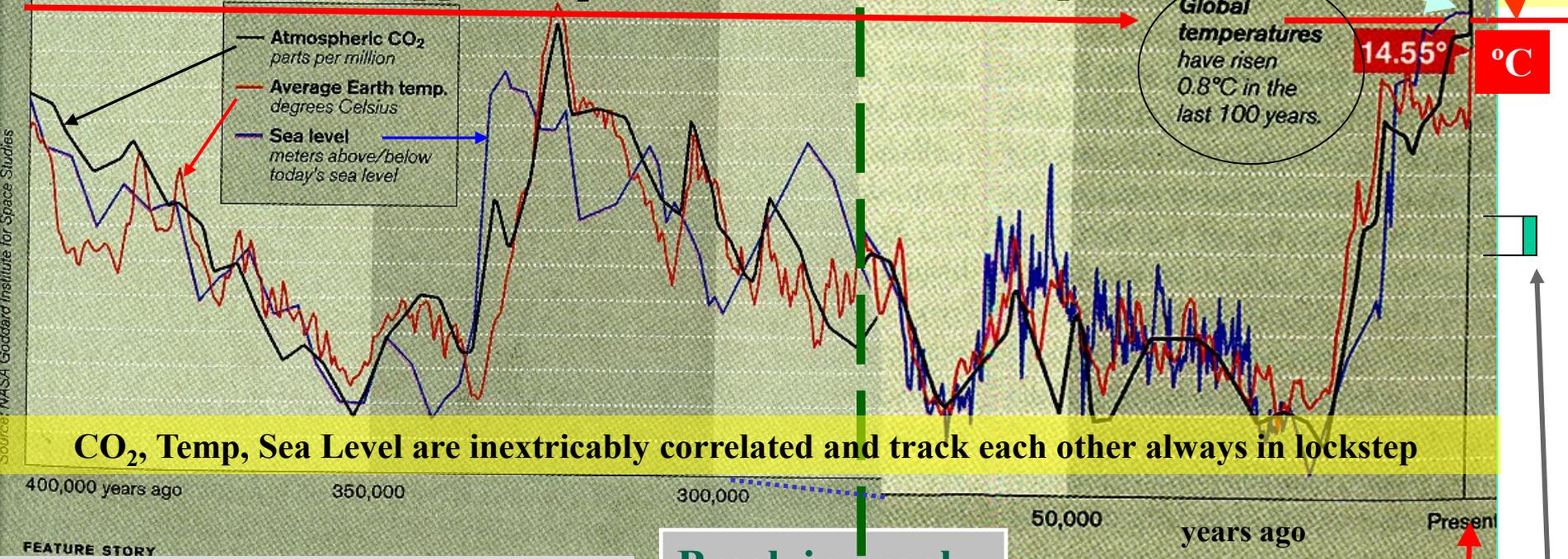
Global CO₂ Level in 2022 **412 ppm**

Baseline from year 1900:
0 m Sea Level = 290 ppm CO₂ = 15°C (59°F) World Temp

Sea Level Gap

Temp Gap: 6°C (9°F)

Global temperatures have risen 0.8°C in the last 100 years.
14.55°C



Source: NASA Goddard Institute for Space Studies

FEATURE STORY
Technology Review, July/August 2006

Break in graph

Present time

6°C forces 70 meters sea level rise (max.)

KEY to graph: 20 ppm = +/-1°C = +/-20m sea level rise (max.)

Jim Hansen's Table of Vostok data points for 400,000 years

| Carbon dioxide p.p.m. | Average Earth temp. °C | Sea level meters |
|--------------------------|------------------------------|---------------------|
| 300 | 15.5 | 10 |
| 290 | 15.0 | 0 |
| 280 | 14.5 | -10 |
| 270 | 14.0 | -20 |
| 260 | 13.5 | -30 |
| 250 | 13.0 | -40 |
| 240 | 12.5 | -50 |
| 230 | 12.0 | -60 |
| 220 | 11.5 | -70 |
| 210 | 11.0 | -80 |
| 200 | 10.5 | -90 |
| 190 | 10.0 | -100 |
| 180 | 9.5 | -110 |
| 170 | 9.0 | -120 |

Is Dr. Hansen's Graph Valid?

1. His accompanying Table here is surprisingly **linear**.
2. This linearity implies an easy to find relationship or **equation** for the three variables.

It yields a simple KEY to graph:
+/- 20 ppm = +/- 1°C = +/- 20m sea level

More and more climatologists are now in agreement with its predictions over 15 years later.

Most importantly, it shows **reversibility!**



Scaling to Billions of Tons of Carbon Capture & Management Infrastructure

Effective decarbonization requires that carbon capture, management and disposition infrastructure and systems be planned and implemented at “GT scale” (Giga Tonne scale), and not through a piecemeal project-based d

Gigaton CO2 Capture will remove 800 GT

Enabling GT scale carbon c
common, scalable and seamless carbon disposition infrastructure.

Vesta and Carbon Engineering offer the hope for billion-ton “GT” carbon capture from atmosphere

STORY, JAN 6, 2016

Environmental Outlook: A New Push For Carbon Removal

Jan 6, 2016 ... Environmental Outlook: A New Push For **Carbon Removal** ... this range from the low **tech** – plant more trees – to the very high **tech** – suck the ...



STORY: NPR, FEB 8, 2021

Elon Musk Funds \$100 Million XPrize For Pursuit Of New Carbon Removal Ideas

Feb 8, 2021 ... **Carbon capture** is a longstanding idea that’s seen as easing costs and other ... The new XPrize aims to close the **technology** gap by spurring ...



WHAT CLEAN ENERGY BREAKTHROUGHS ARE READY TO COME ONLINE?

**Vertical Farming, Bacteria-Biomass
Electricity, Triboelectricity, Solar Lights,
Water Evaporation Power, Osmotic
Power, Hydrokinetic Power, Energy
Harvesting, Undersea Turbines, Magma
Geothermal, Graphene Fluctuating
Circuits, Wireless Electricity, Zero Point
and Vacuum Energy**

Vertical Farming – Aero Farms

<https://www.aerofarms.com/>



- World's largest
- 2 million pounds/year leafy green vegetables
- No soil, No pesticides
- 390x productivity
- **95% less water**



Video is online at <https://tinyurl.com/AeroFarmTour> or click on arrow



Breatharians Live on Light Pranic God Energy



- Thousands are now living without food worldwide
- I have taken the **21-day training**
- Go from fasting to **Pranic Living**
- See **“In the Beginning There was Light”** video
- Many have been tested for a week in clinical setting
- $E = mc^2$ may be the only science to explain the biotransmutations that occur

- **Free book** from

<https://raymaor.com/ebookyearwithoutfood/>

← **Ray Maor**

SOLAR ENERGY MODULES



Solar Illuminations lamp
8 hours light with solar



Select Language

NO KEROSENE="NOKERO"



Inflatable Solar Light:
\$15 from **MPOWERD.COM**

MpowerD also donates these lights to Africa →



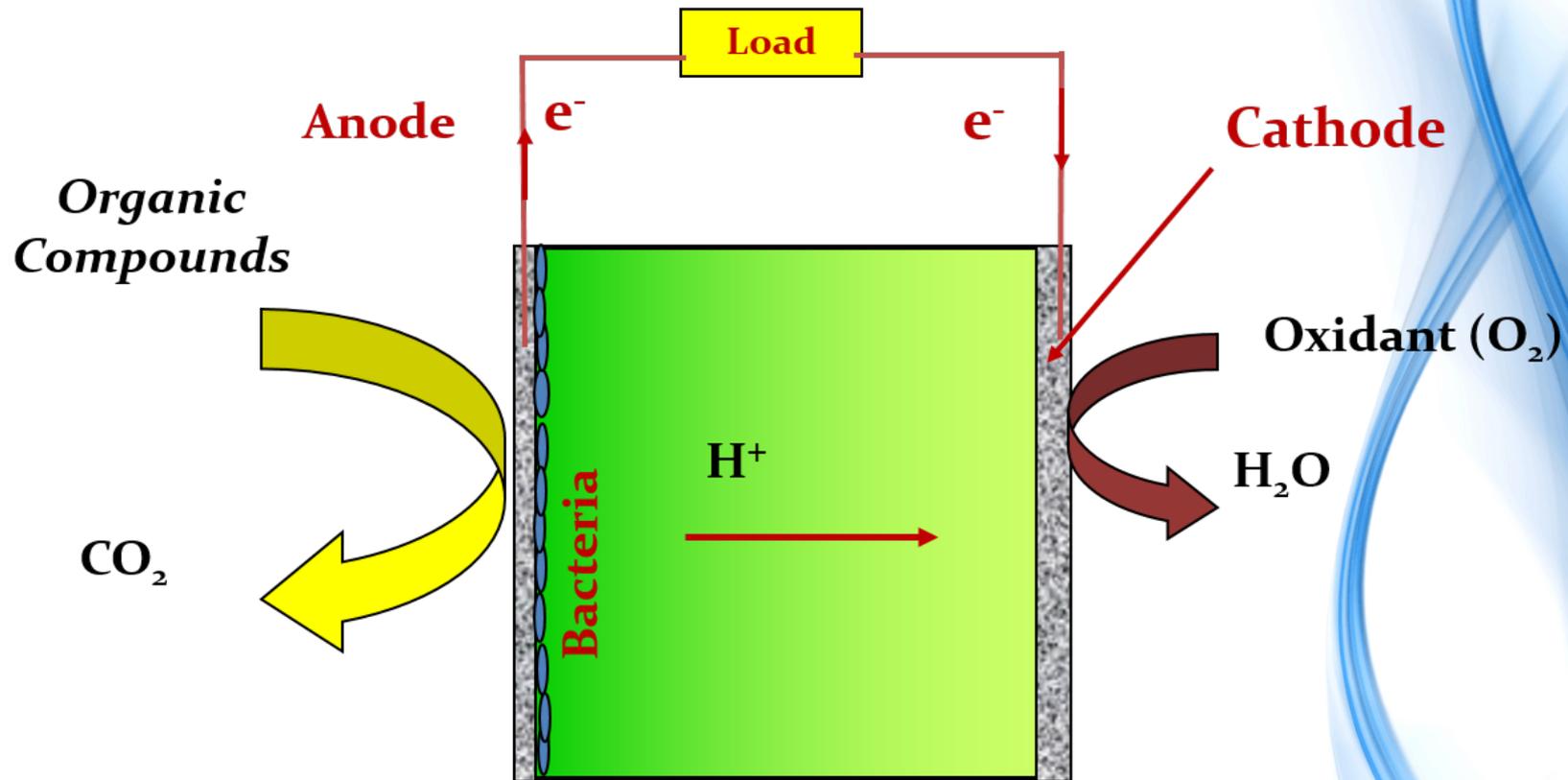
Distributed electricity that is failure-proof:

- solar lanterns
- networked solar rooftops

Thomas Valone - Integrity Research Institute



BACTERIA GENERATE ELECTRICITY AND PURIFY WASTE WATER



Craig Venter Institute testing 600 liters/day pig waste at local farm in Escondido CA and Penn State University both of whom

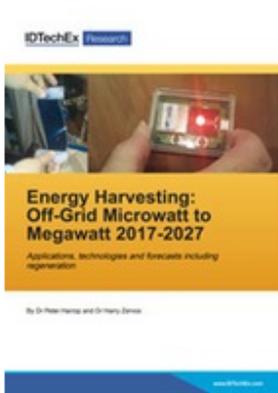
generate kilowatts from human waste

United State's Capital **D.C. Water** Harnesses Electricity from Every Flush



Uses Norway's "**THERMAL HYDROLYSIS**" to convert sludge left over from sewage (with microbes) into **13 MW** of electricity

Energy Harvesting = \$7B Market

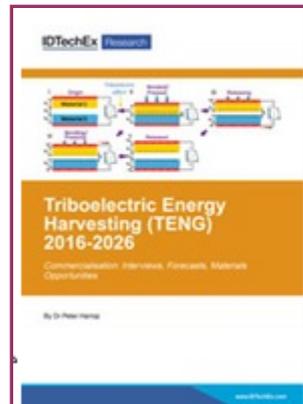


Energy Harvesting: Off-Grid Microwatt to Megawatt 2017- 2027

Applications, technologies,
forecasts including regeneration

By [Dr Peter Harrop](#) and [Dr Harry Zervos](#)

Reports Published by **IDtechEx.com**



Triboelectric Energy Harvesting (TENG) 2016-2026

Commercialisation: Interviews,
Forecasts, Materials Opportunities

Brand new for August 2016.

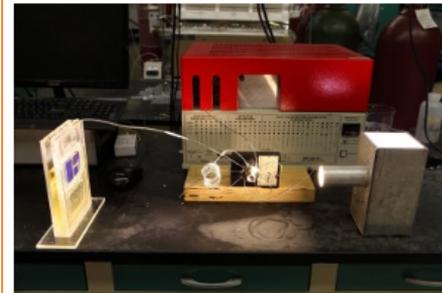
Harvests electrostatic energy with
polymers for self-powered systems

By [Dr Peter Harrop](#)

Triboelectric energy harvesting transducers will be a \$400 million market in 2027

Posted on August 10, 2016

Solar cell captures CO2 and sunlight, produces burnable fuel



Researchers at the University of Illinois at Chicago have engineered a potentially game-changing solar cell that cheaply and efficiently converts atmospheric carbon

[gy/energyharvestingjournal.com/articles/9812/solar-cell-captures-co2-and-sunlight-...](http://energyharvestingjournal.com/articles/9812/solar-cell-captures-co2-and-sunlight-...)

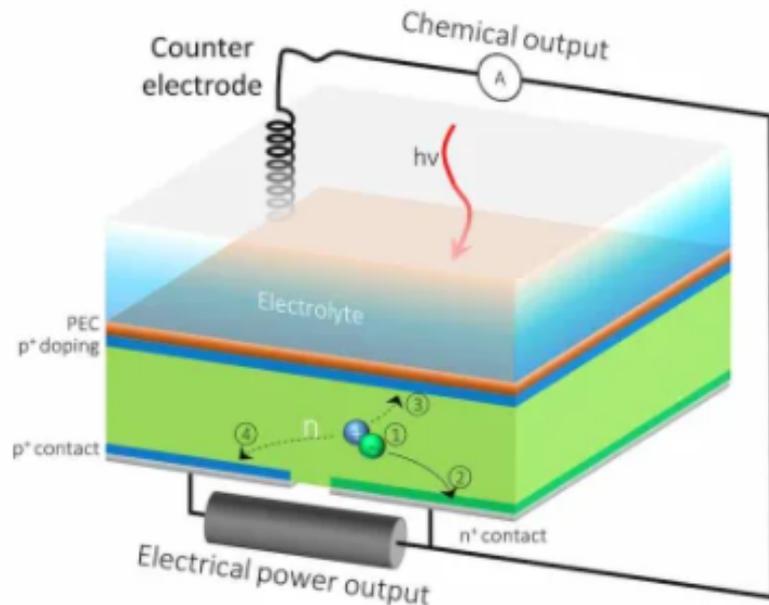
"This market will reach over \$1.1 billion by 2026"

HPEV SOLAR CELL: ENERGY & FUEL

NOVEMBER 7, 2018 | PHOTONICS/OPTICS | ENERGY | IMAGING

Solar Cell Does Double Duty for Renewable Energy

Photonics & Imaging Technology INSIDER



NASA Tech Briefs, Nov. 2018

<https://www.techbriefs.com/>

Hybrid PhotoElectrochemical and Voltaic (**HPEV**) cell

Turns sunlight and water into not just one, but two types of energy: **hydrogen fuel and electricity**

Lawrence Berkley National Lab
Joint Center for Artificial Photosynthesis

7% efficiency: solar hydrogen fuel
13% efficient: electricity generation

20% total efficiency

The HPEV cell's extra back outlet would allow the current to be split into two, so that one part of the current contributes to solar fuels generation, and the rest can be extracted as electrical power. (Credit: Berkeley Lab, JCAP) www.LBL.gov

environment and energy

RETURN TO ISSUE | < PREV PERSPECTIVE NEXT >

Atmospheric Water Harvesting: A Review of Designs

Xingyi Zhou, Hengyi Lu, Fei Zhao*, and Guihua Yu*

Cite this: *ACS Materials Lett.* 2020, 2, 7, 671–684

Article Views

Altmetric

Publication Date: May 7, 2020

<https://doi.org/10.1021/acsmaterialslett.0c00130>

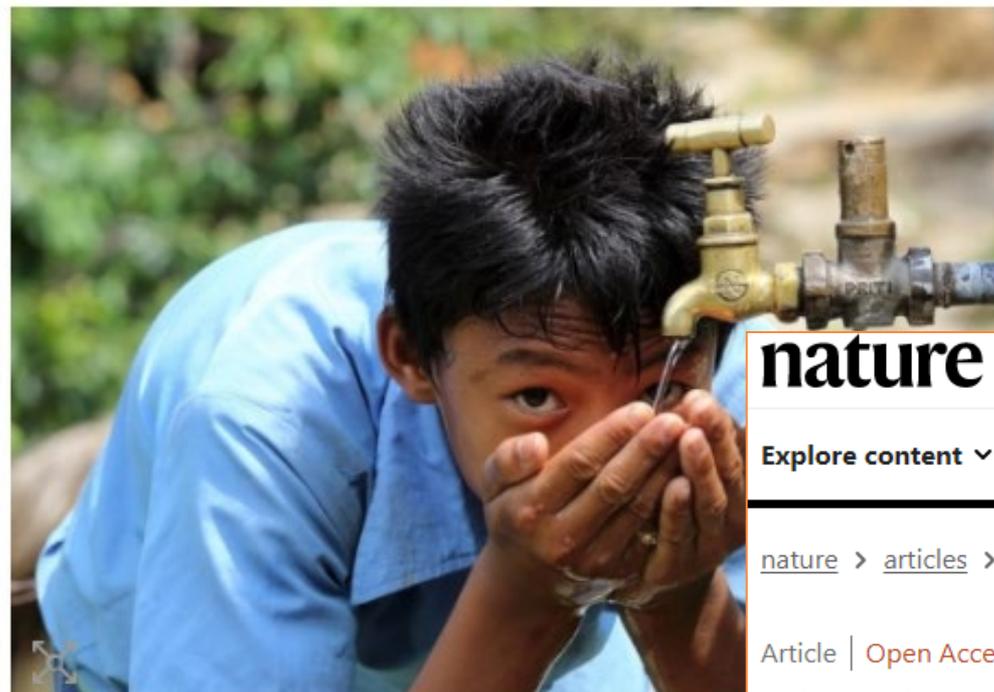
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ENVIRONMENT AND ENERGY | RESEARCH UPDATE

Solar-powered harvesters could produce clean water for one billion people

13 Nov 2021



Human right: this boy in Nepal has access to safely managed water in his home country and beyond do not. (Courtesy: Australian Department of Foreign Affairs and Trade)



OCTOBER 27, 2021

Harvesting water from the air

Sharing Project H2E's findings on improving access to clean drinking water

nature

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OPEN ACCESS

Article | [Open Access](#) | [Published: 27 October 2021](#)

Global potential for harvesting drinking water from air using solar energy

AQUANTIS BUILDING UNDERSEA TURBINES

AquantisTech.com

Potential of world's oceans is **5 TW** (5,000 GW)

Hydrokinetic (MHK) energy operates 24/7

- Undersea Turbines distributed to Wales and the Isle of Wight
- **200 MW field of marine turbines** are in the Gulf Stream
- Large ocean circulation currents are marine energy sources

Surface entry to all systems; high power-to-weight ratio; low cost deployment; ease of operation and maintenance; stable spar buoy vessel anchored to seabed



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Energy Harvested from Evaporation Could Power Much of U.S., Says Study

September 26, 2017



Sci. Amer. 313,
26, Aug. 2015
**Toy car runs
on the
energy of
evaporation**

ENERGY OF EVAPORATION

Harvard Univ. and
Columbia Univ.

HOW IT WORKS

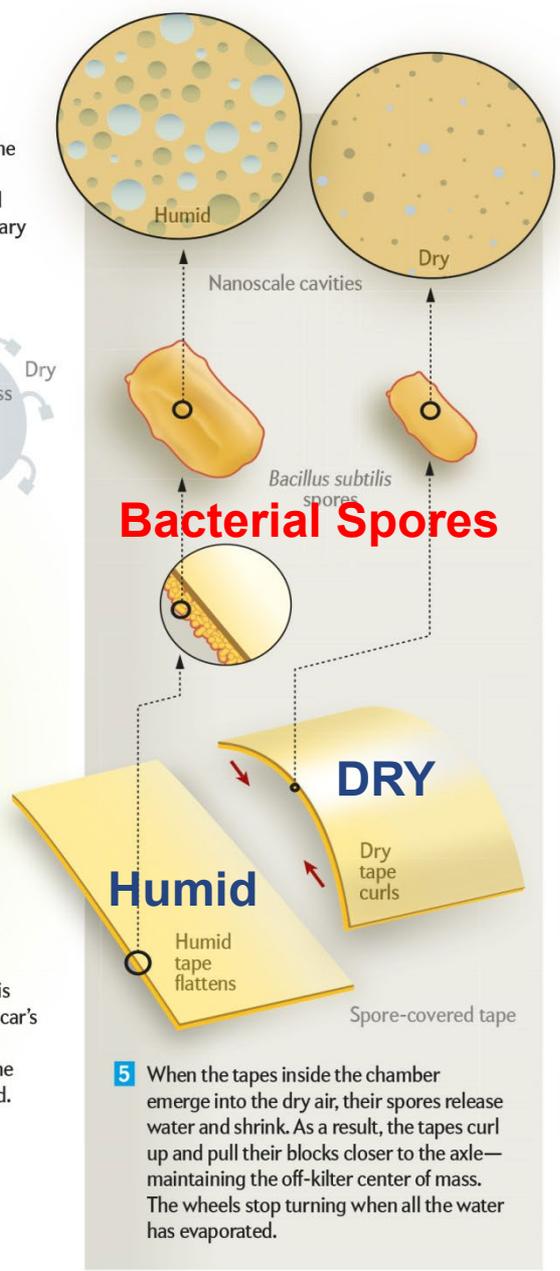
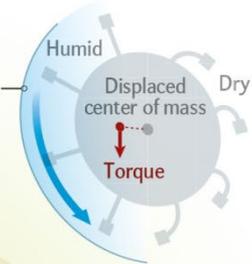
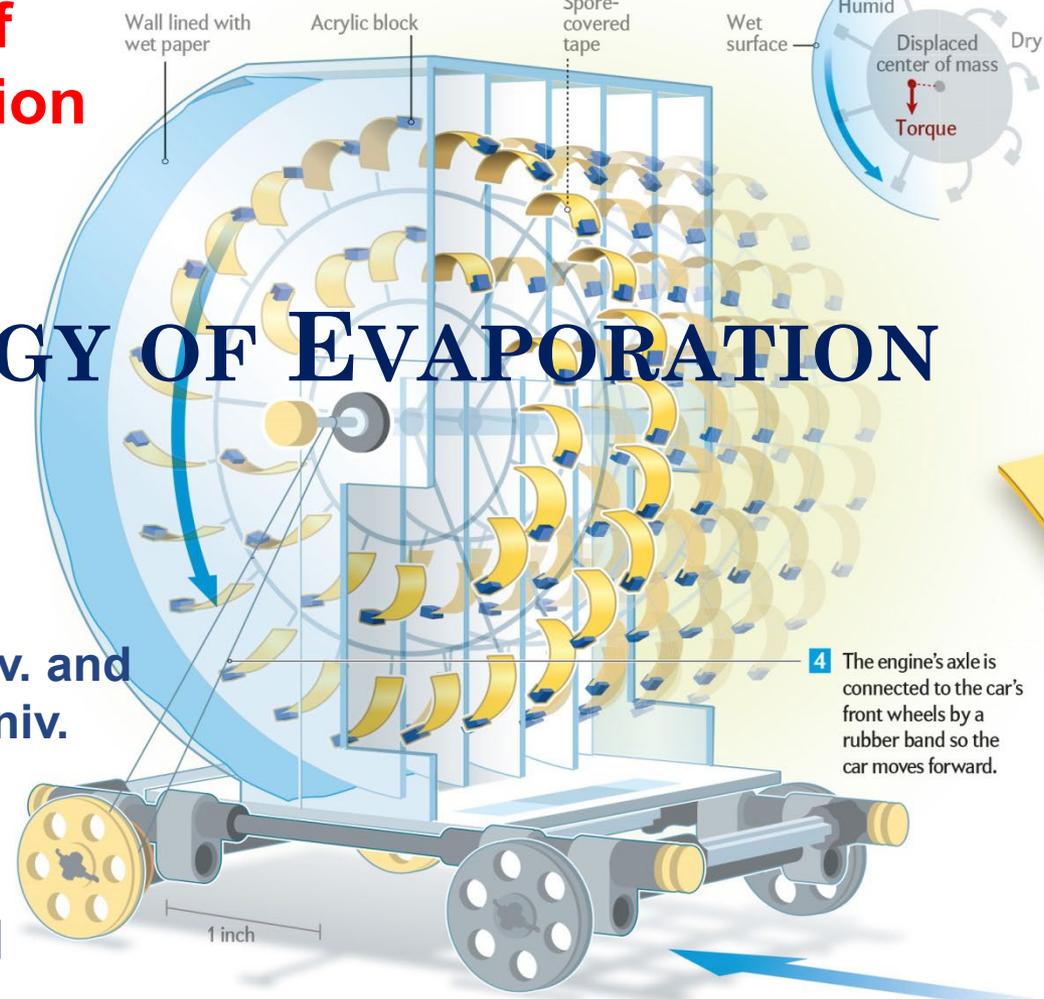
1 A person wets the paper walls of a chamber that encloses the front half of a rotary engine. Drops of water evaporate, creating a humid environment within the chamber.

2 Bacterial spores on plastic tapes inside the chamber absorb the moisture and expand, causing the tapes to lengthen. Small, acrylic blocks at the ends of the tapes now hang farther from the axle than the blocks outside the chamber.

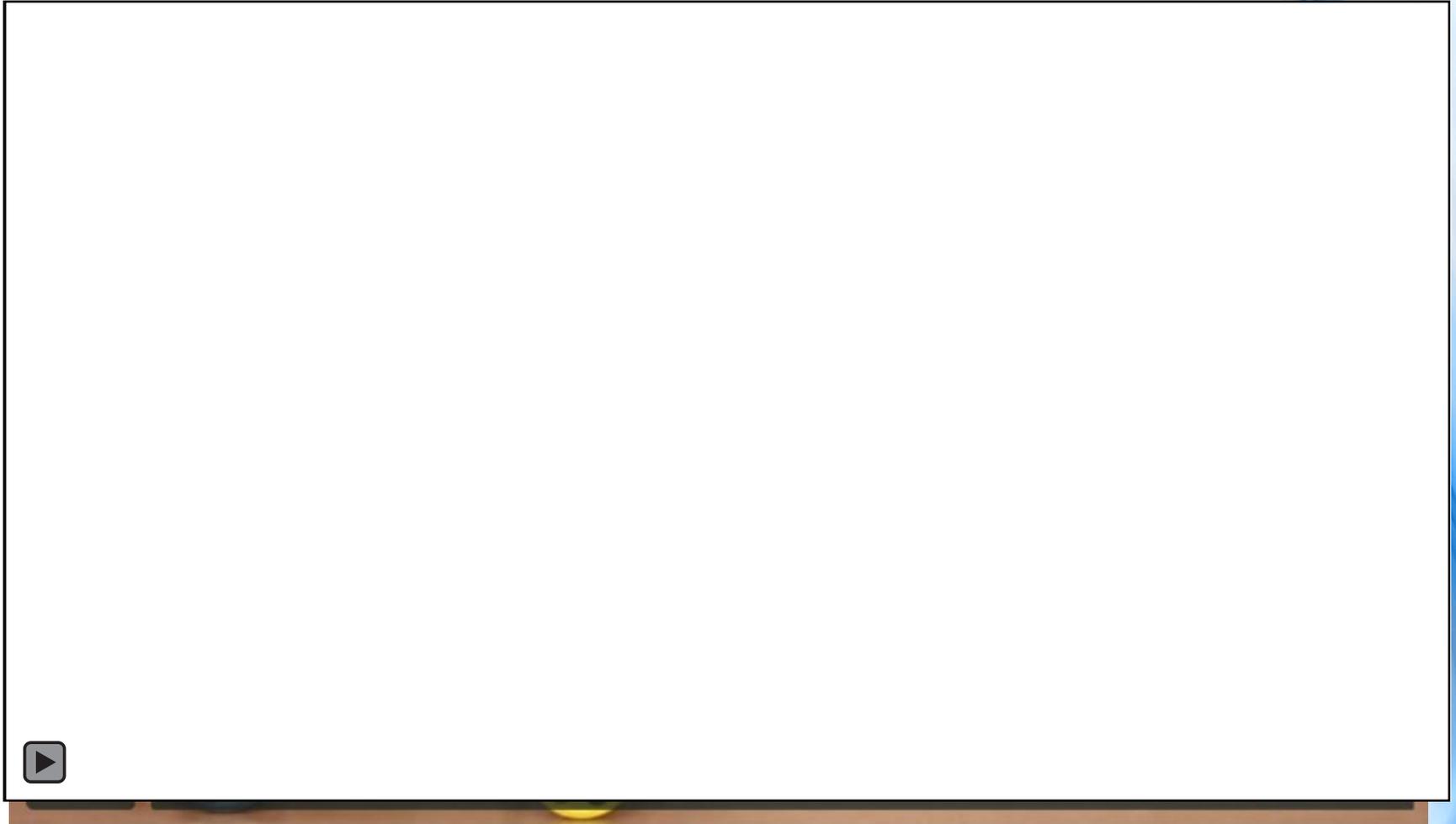
3 The imbalance shifts the center of mass of the structure away from the axis of rotation and creates torque. The rotary engine begins to turn.

4 The engine's axle is connected to the car's front wheels by a rubber band so the car moves forward.

5 When the tapes inside the chamber emerge into the dry air, their spores release water and shrink. As a result, the tapes curl up and pull their blocks closer to the axle—maintaining the off-kilter center of mass. The wheels stop turning when all the water has evaporated.

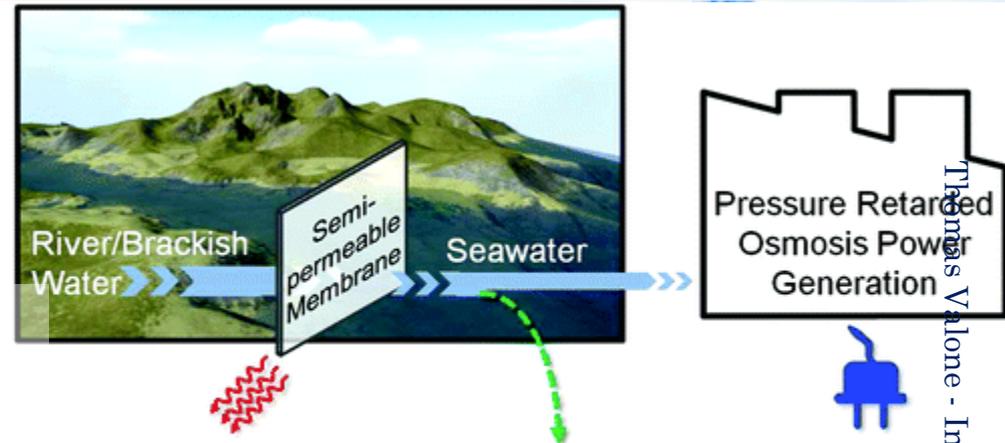
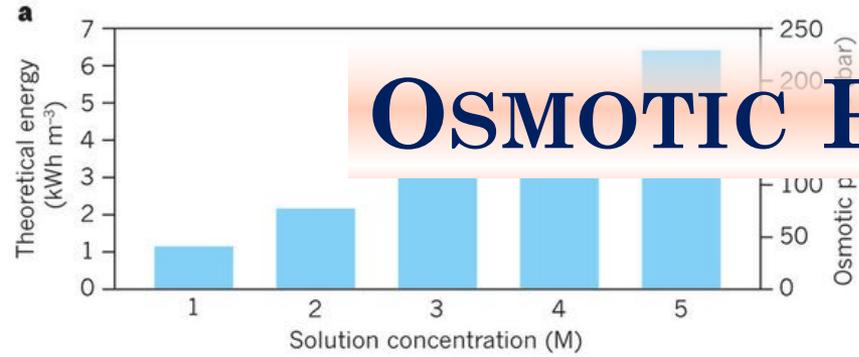


WATER-EVAPORATION CAR – COLUMBIA UNIV.



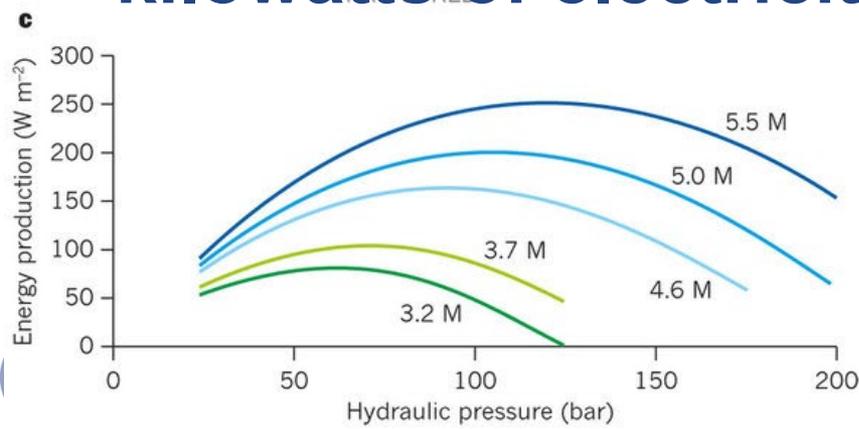
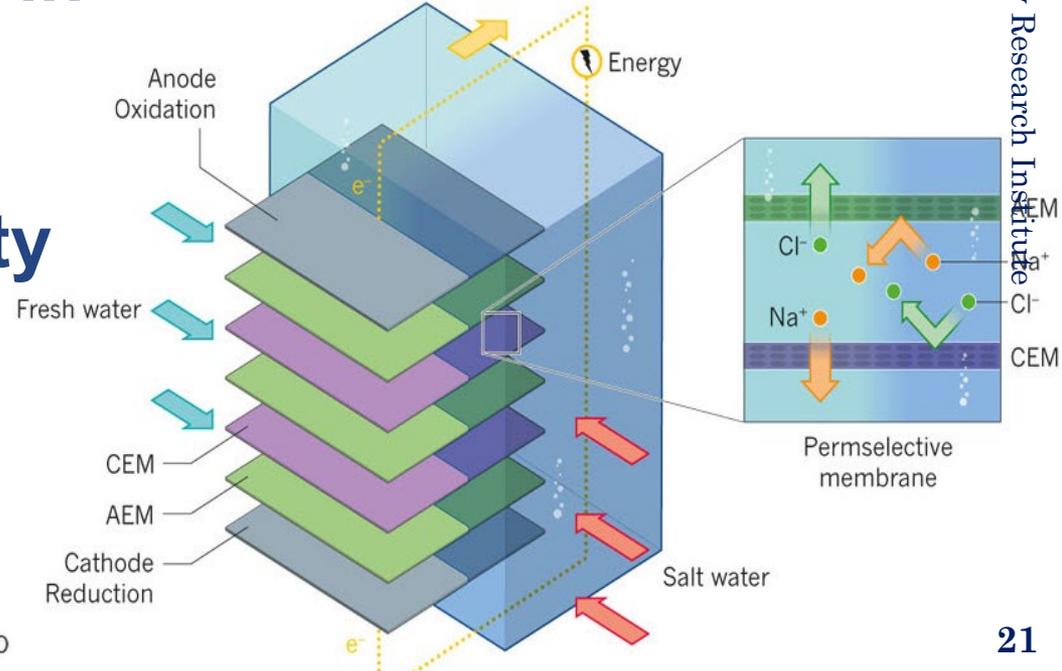
<https://vimeo.com/235801232> Video link or click on arrow

OSMOTIC POWER GENERATION



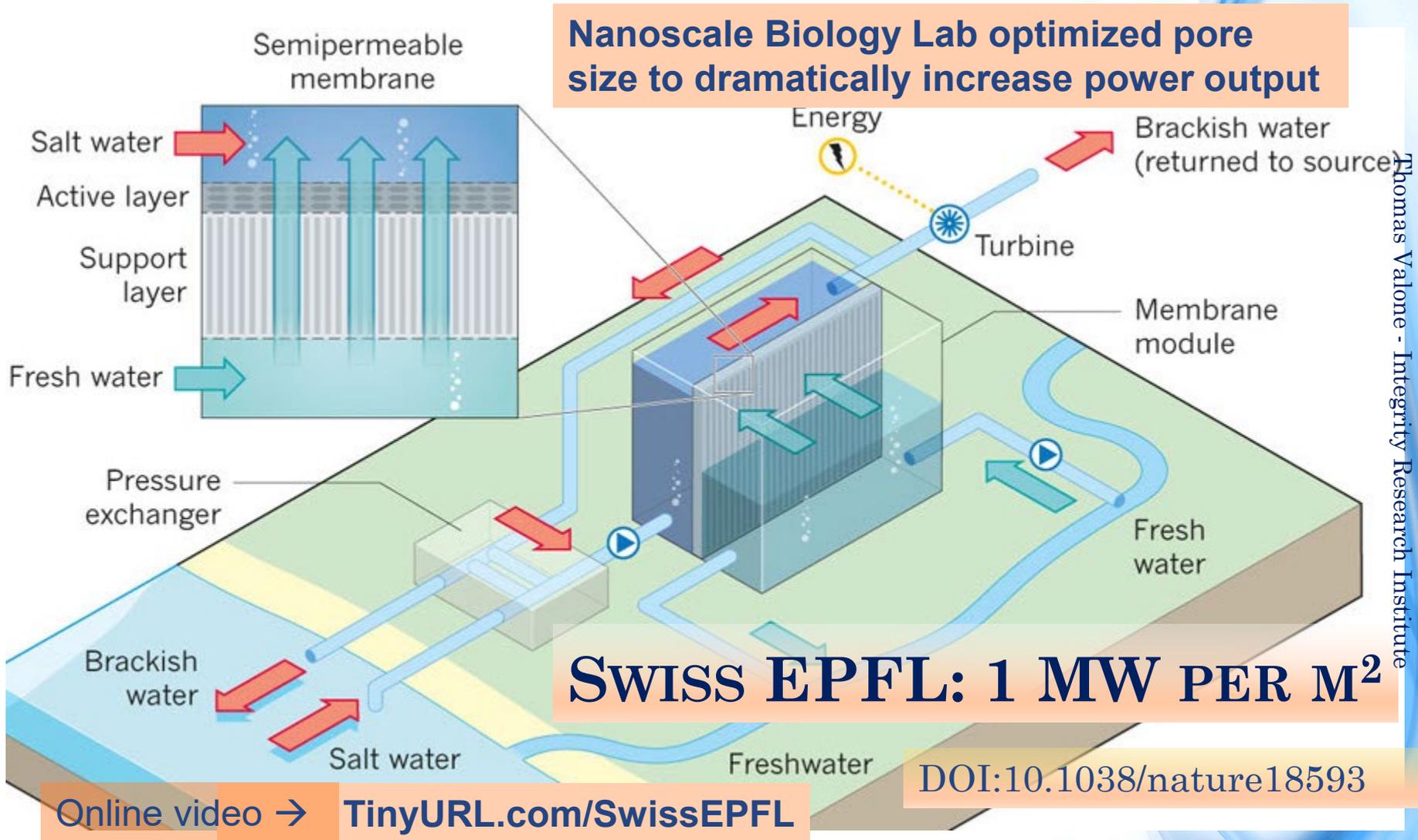
Norway's **Statkraft** opened world's first osmotic power plant in 2009 to produce emission-free kilowatts of electricity

$$\Delta G_{\text{mix}} = \text{Frictional Losses} + \text{Unutilized Energy} + \text{Extractable Work}$$



Thomas Valone - Integrity Research Institute

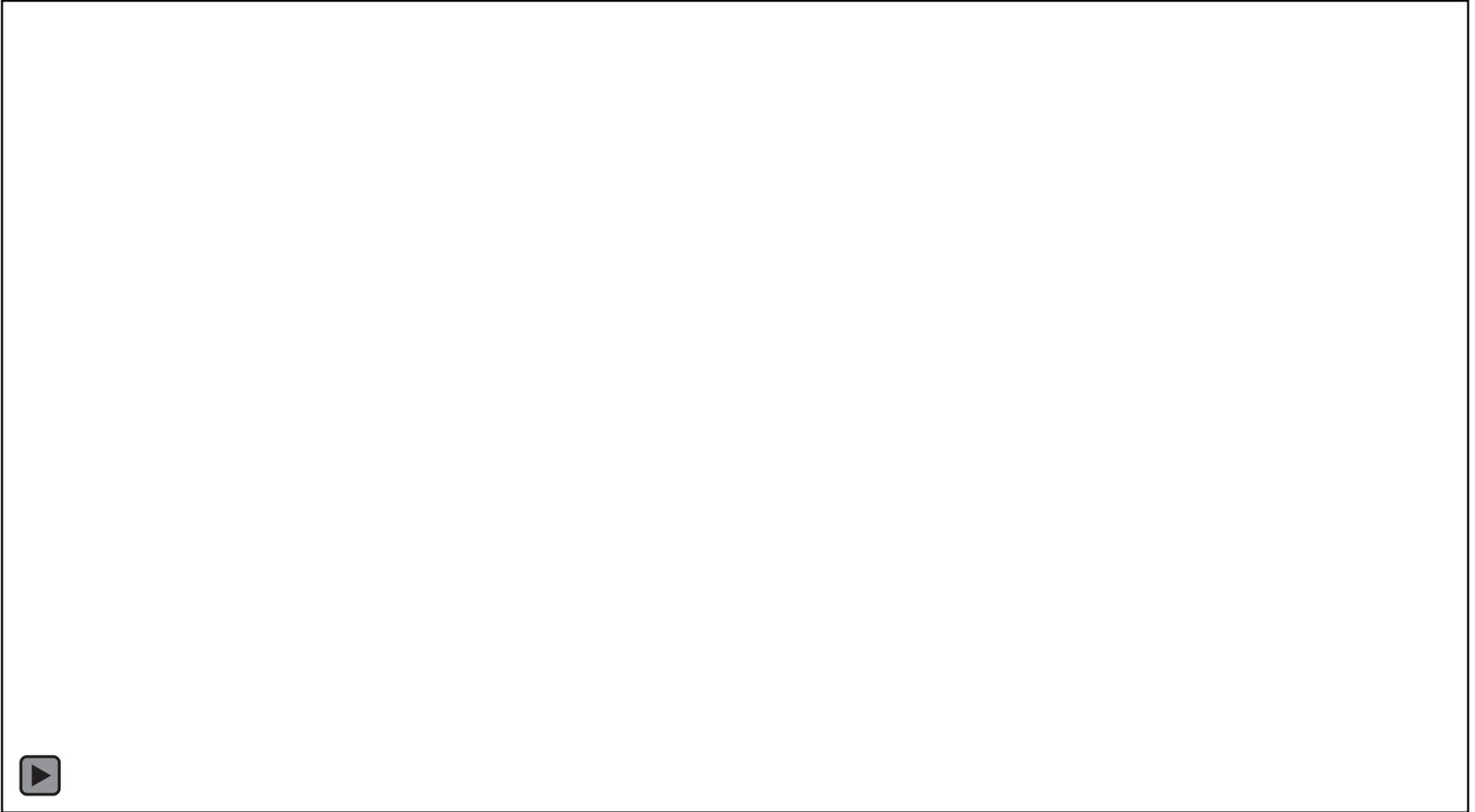
“Osmotically induced current”–*Nature*, July, 2016



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Swiss EPFL Osmotic Power

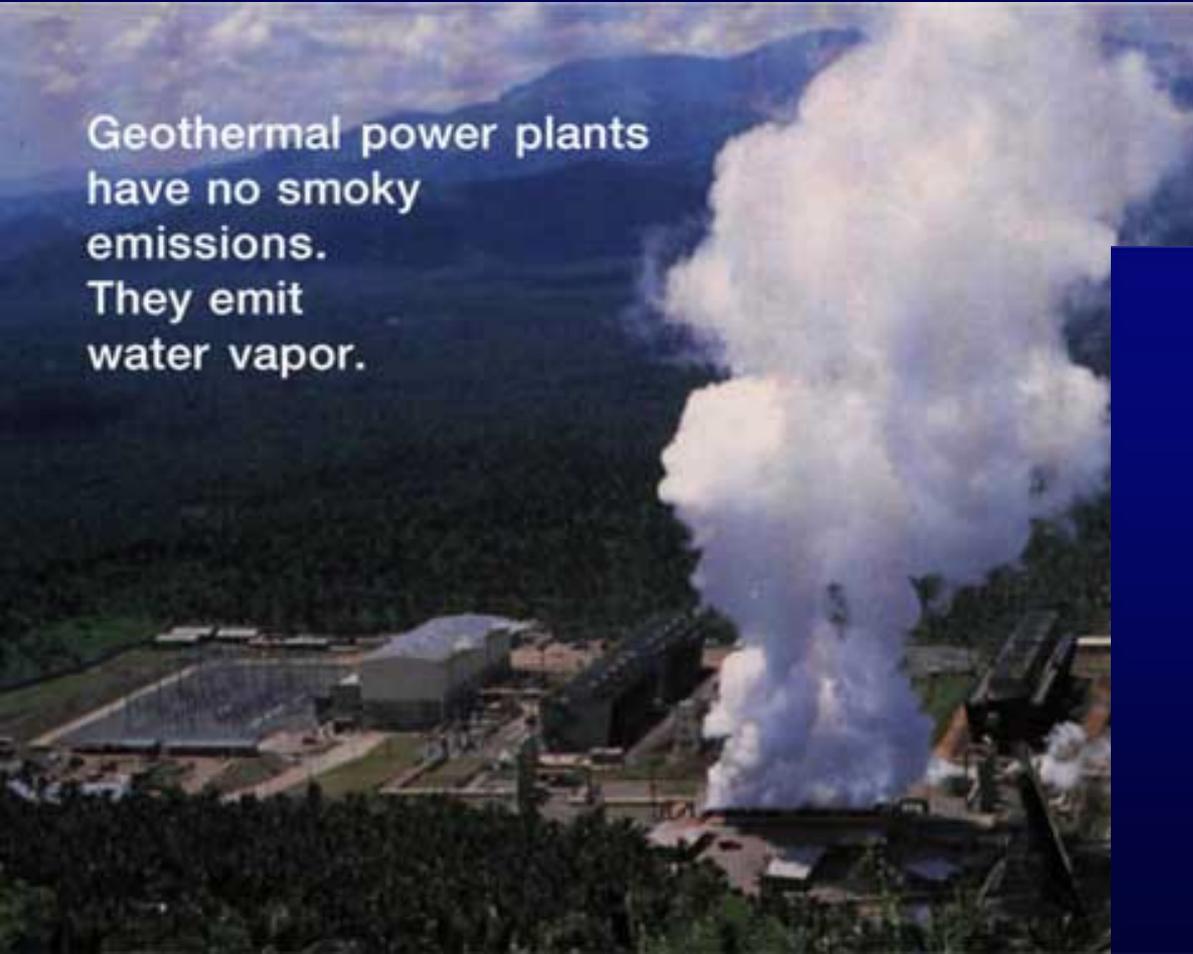
Ecole Polytechnique Federale de Lausanne – 4 min. video -- [TinyURL.com/SwissEPFL](https://tinyurl.com/SwissEPFL)



U.S. Geothermal Power

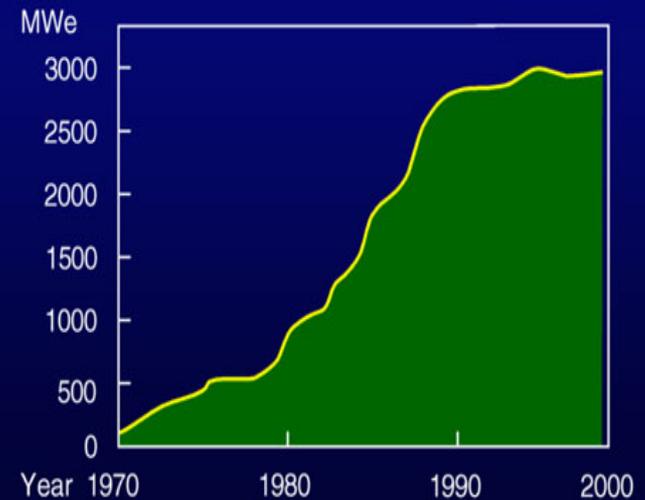
Over 2,800 megawatts of electricity from geothermal power plants are supplying about 4 million people in the U.S.

Geothermal power plants have no smoky emissions. They emit water vapor.



Jan. 22, 2007
MIT Panel Backs Geothermal as a KEY US Energy Source – report: mit.edu

Growth in U.S. Geothermal Power



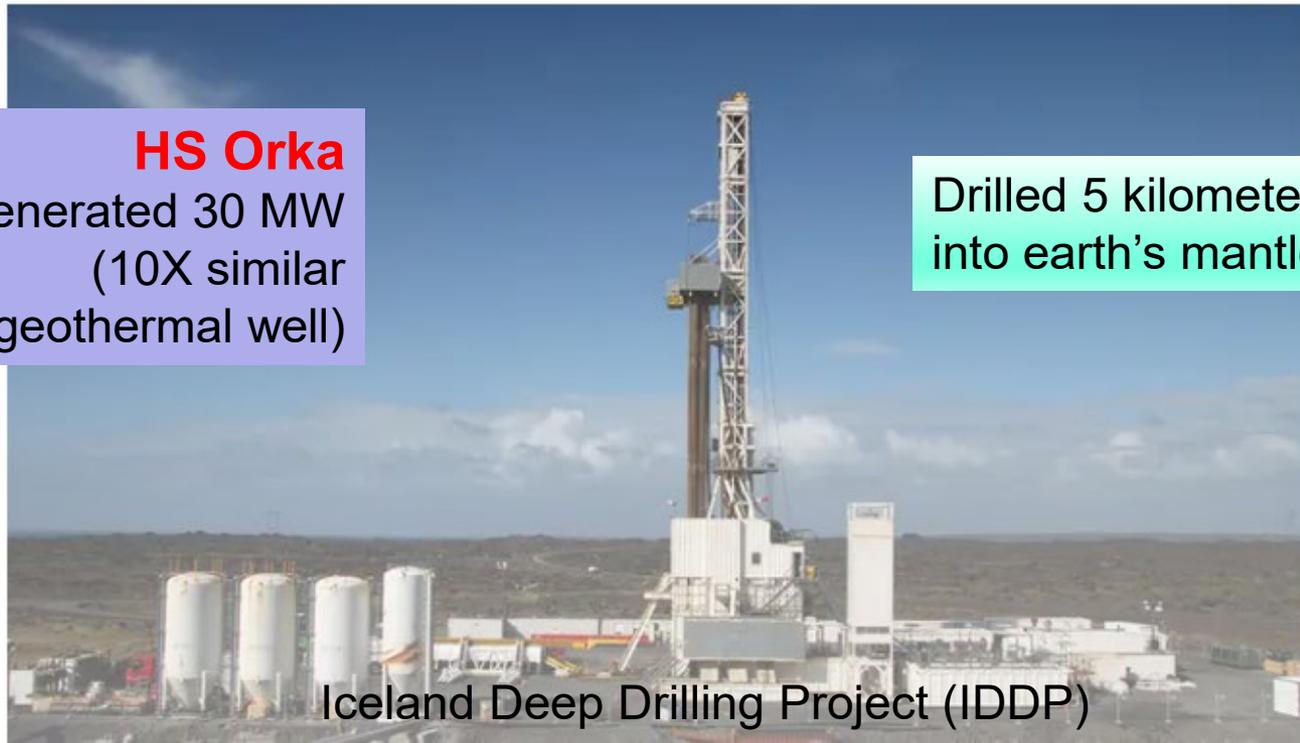
Thomas Valone, Integrity Research Institute

Iceland drills hottest hole to tap into energy of molten magma



EARTH 21 October 2016

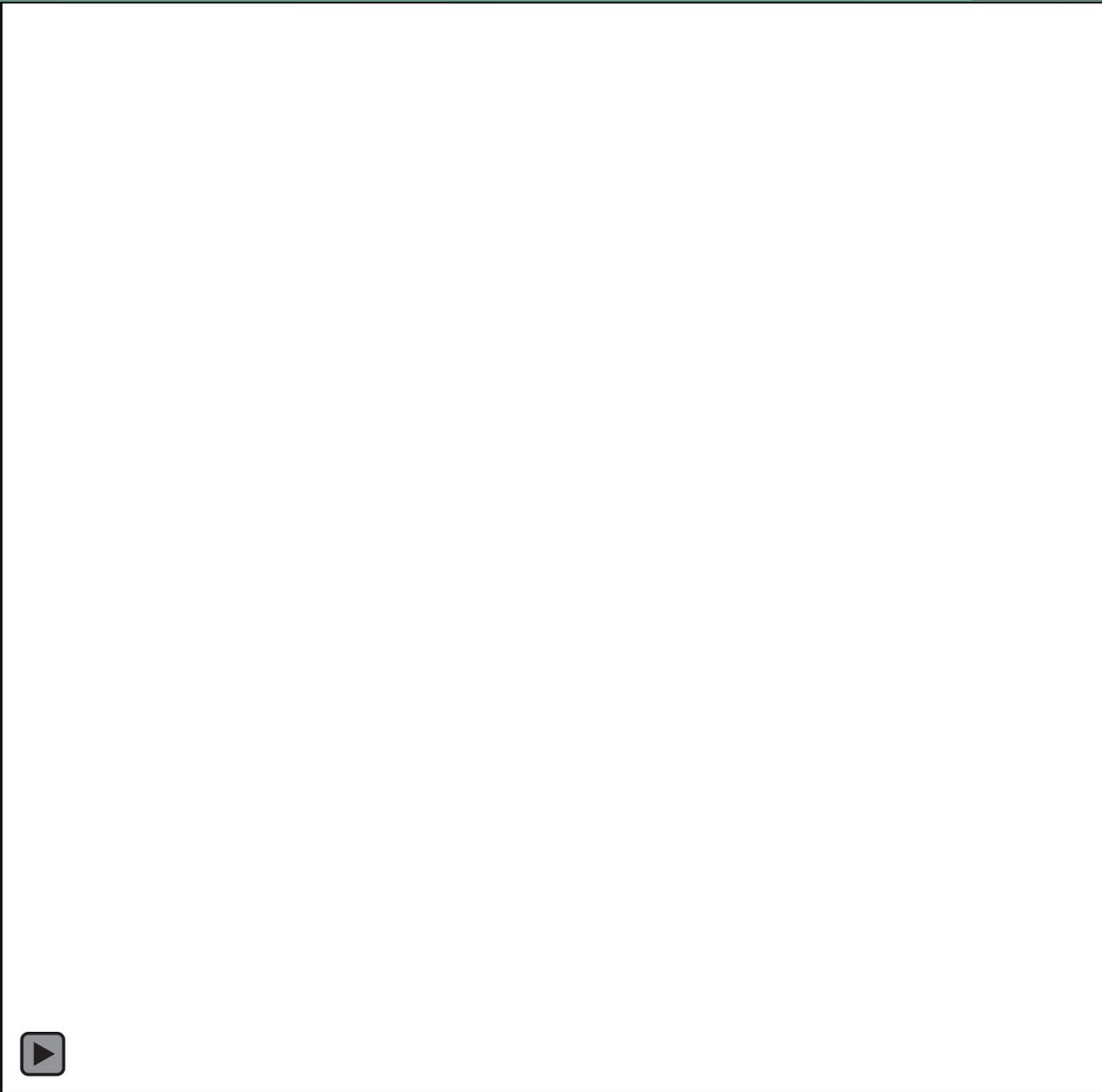
By [Fred Pearce](#)



HS Orka
Generated 30 MW
(10X similar
geothermal well)

Drilled 5 kilometers down
into earth's mantle

Iceland Deep Drilling Project (IDDP)



Magma Fueled Energy – click on arrow or see this one minute video online at <https://tinyurl.com/MagmaEnergy>

GRAPHENE ENERGY HARVESTING (GEH)

Thermal (and non-thermal) perpetual motion: graphene nanolayers now in a GEH chip to be released this year by **NTSinnovations.com**

PHYSICAL REVIEW E
covering statistical, nonlinear, biological, and soft matter

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Fluctuation-induced current from freestanding graphene

P. M. Thibado, P. Kumar, Surendra Singh, M. Ruiz-Garcia, A. Lasanta, and L. L. Bonilla
Phys. Rev. E **102**, 042101 – Published 2 October 2020

University of Arkansas

NEWS

Thursday, December 30, 2021

Q SEARCH NEWS

May be the first commercial **Free Energy** device on the market!

Physicists Build Circuit That Generates Clean, Limitless Power From Graphene

Oct. 02, 2020

FAYETTEVILLE, Ark. – A team of University of Arkansas physicists has successfully developed a circuit capable of capturing graphene's thermal motion and converting it into an electrical current.

"An energy-harvesting circuit based on graphene could be incorporated into a chip to provide clean, limitless, low-voltage power for small devices or sensors," said Paul Thibado, professor of physics and lead researcher in the discovery.

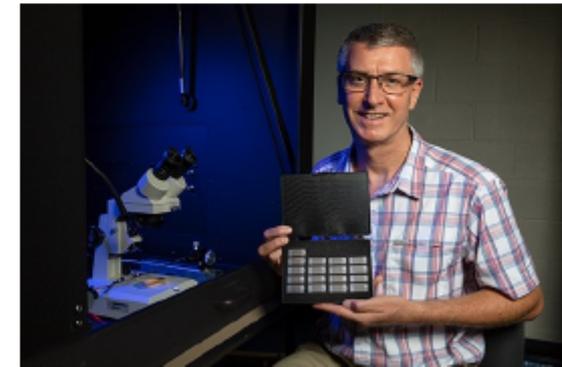


Photo by Russell Cothren

Paul Thibado, professor of physics, with sample energy-harvesting chips under development.



Zero-Point Energy Technology

Casimir-cavity devices for zero-point-energy harvesting

*Lab Publications

- "Casimir-cavity-induced conductance changes," G. Moddel, A. Weerakkody, D. Doroski, D. Bartusiak, Physical Review Research, 3, L022007 (2021); DOI: 10.1103/PhysRevResearch.3.L022007.
- "Optical-Cavity-Induced Current." G. Moddel, A. Weerakkody, D. Doroski and D. Bartusiak, Symmetry, 13(3), 517; doi.org/10.3390/sym13030517 (2021).
- "Extraction of Zero-Point Energy from the Vacuum: Assessment of Stochastic Electrodynamics-Based Approach as Compared to Other Methods," Garret Moddel and Olga Dmitriyeva, Atoms, 7 (51), 18 pages, (2019); DOI:10.3390/atoms7020051.

[Tinyurl.com/Moddel-ZPE](https://tinyurl.com/Moddel-ZPE)
Best lecture by Garret 😊

Rectenna Solar Cells, Metal-Insulator Technology & Geometric Diodes

Zero-Point Energy Technology

Low Energy Nuclear Reactions

Liquid Crystal Spatial Light Modulator

Additional Optoelectronics Technology

Presented at COFE5 held at U of Maryland by IRI

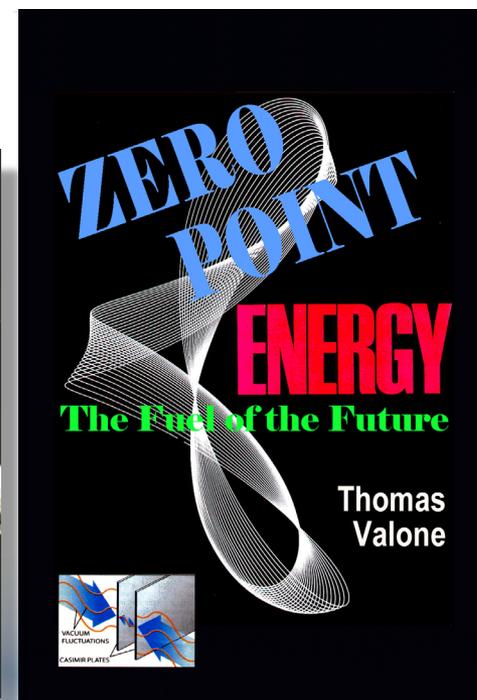
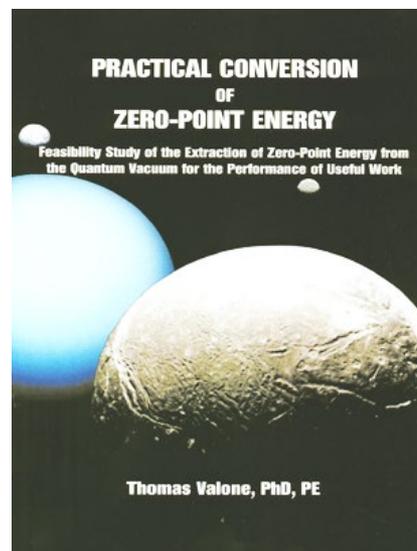
Further information – Valone books →

 University of Colorado Boulder

Garret Moddel

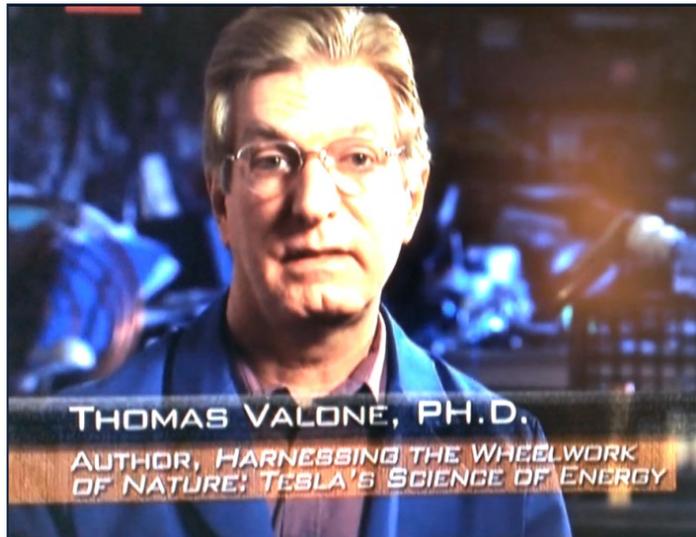
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

 Research Group Contact Us

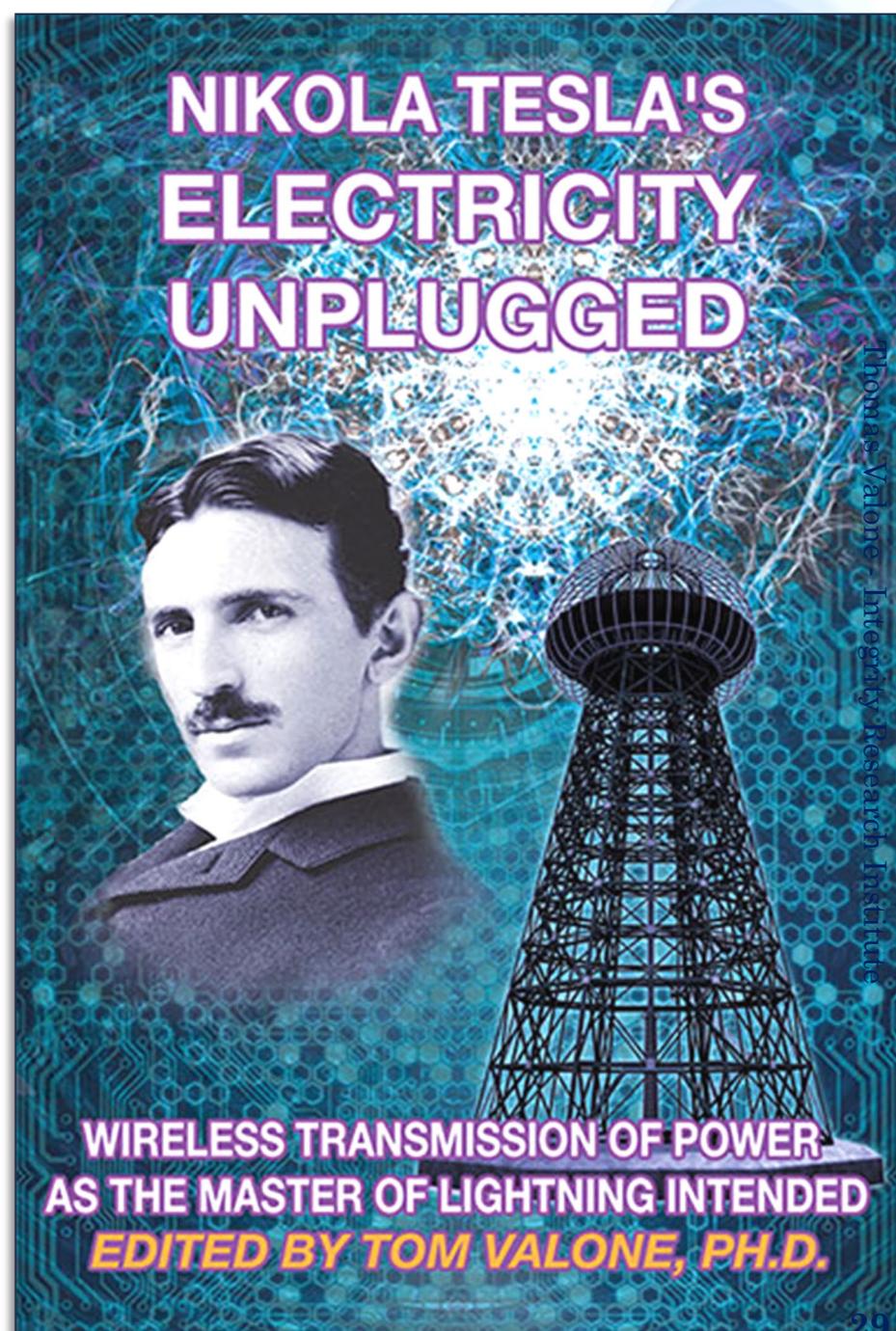


WIRELESS POWER BEING DEVELOPED

From short range to long range, the latest wireless solutions are in a 450-page illustrated book → Long range wireless power transmission uses Zenneck Surface Waves, being demonstrated by Texzon Technologies (Texzont.com)

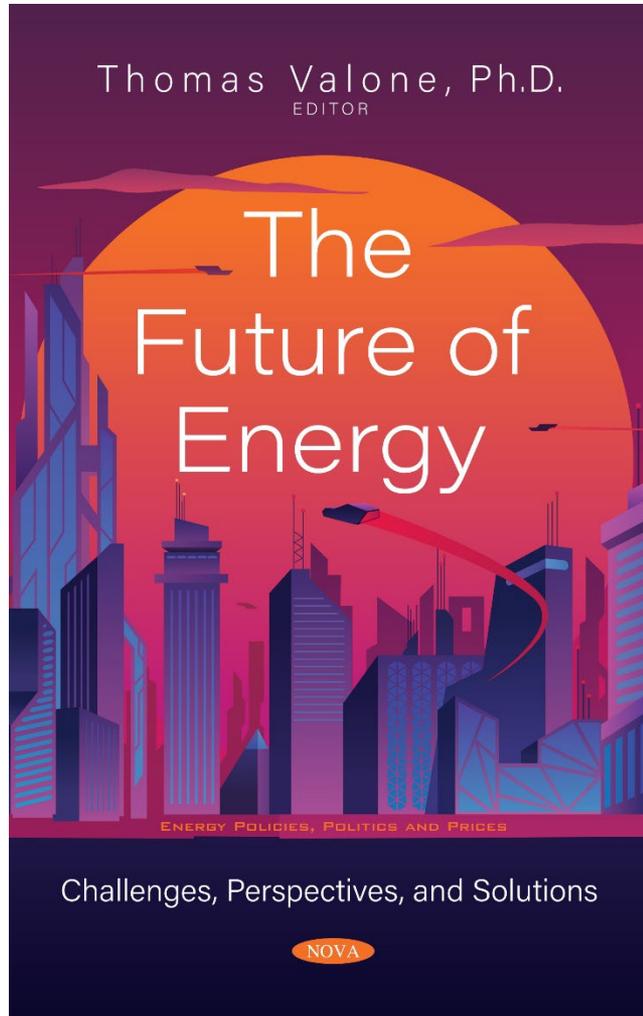


Featured on the History Channel



The Future of Energy

Nova Science Publishers



Fusion-Fission, LENR, Manelas Car

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(Thomas F. Valone, Integrity Research Institute, Beltsville, MD, US)

Chapter 2. Smart Cities and Energy Storage
(Antonio Colmenar-Santos, Enrique Luis Molina, Enrique Rosales-Asensio and David E. Borge-Diez, Department of Control Engineering, UNED, Ciudad Universitaria, Madrid, Spain, and others)

Chapter 3. Energy Resiliency and Microgrids
(Antonio Colmenar-Santos, Enrique Rosales-Asensio and David Borge-Diez, Department of Control Engineering, UNED, Juan del Rosal, Madrid, Spain, and others)

Chapter 4. Methods for 1D ZnO Nanostructures and Potential for Future Solar Cells
(Kelvii Wei Guo, Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Kowloon, Hong Kong)

Chapter 5. Possible Future Development of a Fusion-Fission Hybrid Reactor as a Clean Energy Source
(John E. Brandenburg, Kepler Gravity Sciences Inc., Midland, TX, US)

Chapter 6. Low Energy Nuclear Reactions: Documentation of Research Records
(Thomas Grimshaw, LENRGY LLC, Austin, Texas, US)

Chapter 7. Electric Vehicle Development by Arthur Manelas with Anomalous Results
(Thomas Grimshaw, LENRGY LLC, Austin, Texas, US)

Chapter 8. Questioning the Future of Solar Energy
(Judy Kosovich, Consultant, Washington, DC, US)

Chapter 9. Nikolai Kozyrev: His Theory of Time and the True Position of Stars
(Thorsten Ludwig and Marco Bischof, German Space Power Association [DVR], Czernivtsi, Ukraine)

Chapter 10. Nonlinear Electromagnetic Energy Device and Potential Explanations
(P. A. Murad, M. J. Boardman, J. E. Brandenburg and W. Mitzen, Morningstar Applied Physics, LLC, Vienna, Virginia, US)

Chapter 11. Gravity/Anti-Gravity, Libration Points, and Relativity: Exposing the Light of Gravity
(P. A. Murad, Morningstar Applied Physics, LLC, Vienna, Virginia, US)

Chapter 12. Proton and Electron Production and Destruction as Sources of Energy
(Ray Fleming, Austin Applied Research Laboratory, Austin, Texas, US)

GravitoElectroMagnetics

Nova Science Publishers

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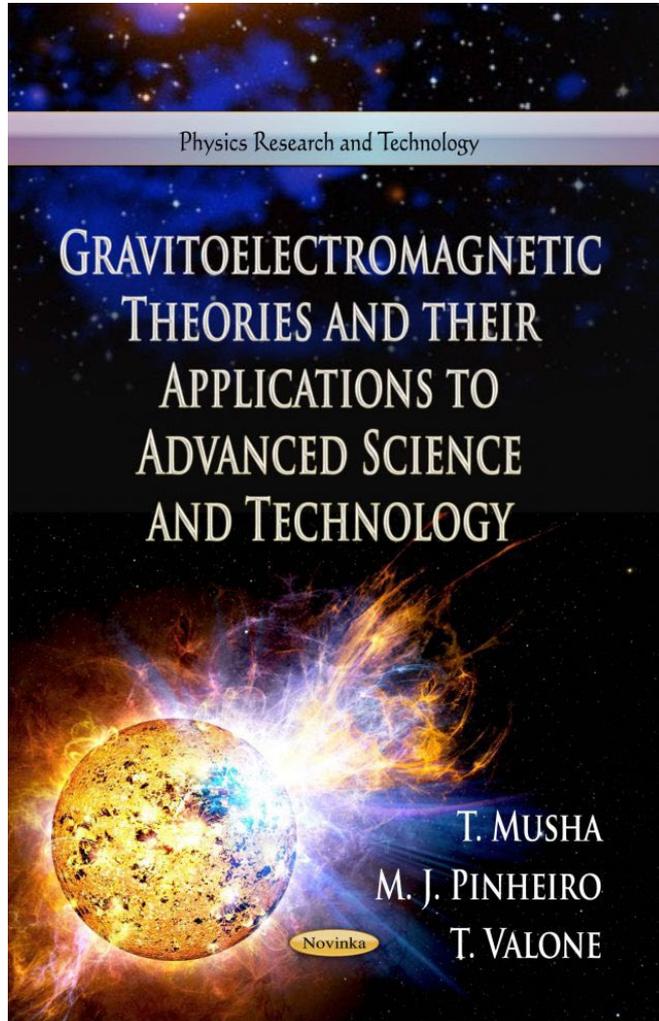


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