

Re: Oil replacement

Source: <http://sci.tech--archive.net/Archive/sci.energy/2005-05/msg00084.html>

- *From:* Tim Keating <NotForJunkEmail@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Sat, 07 May 2005 22:55:05 -0400
-

On Sun, 08 May 2005 00:37:41 GMT, Robert <RB@..> wrote:

>On Fri, 06 May 2005 17:55:23 -0400, Tim Keating
><NotForJunkEmail@xxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:
>
>>On Fri, 06 May 2005 08:44:19 GMT, Robert <RB@..> wrote:
>>
>>>On 5 May 2005 14:13:52 -0700, "bill" <ford_prefect42@xxxxxxxxxxxx> wrote:
>>>
>>>>Chris no-spam wrote:
>>>>> Our population will limit in a natural way. Like starvation or
>>>>>epidemic. A
>>>>> cruel dictator might just deny food to some of his population to
>>>>>allow
>>>>> others to live well. I expect wars over dwindling resources (what
>>>>>was Iraq
>>>>> about?) and eventually families and individuals fighting over food
>>>>>locally.
>>>>>
>>>>> The result will be a much smaller global population each region
>>>>>having the
>>>>> population that can be supported with local produce.
>>>>>
>>>>> Unless a plentiful cheap energy source is found, then none of our
>>>>>high
>>>>> energy intensive culture will survive. Think of the energy required
>>>>>to make
>>>>> a mobile phone, a computer and how much energy does an airoplane use?
>>>>>
>>>>> There will be none of that. And no more high tech wars!!
>>>>>
>>>>> The last 100 years will be a vague memory preserved in traditions and
>>>>>old
>>>>> books, rapidly falling apart, disks that cannot be read and the
>>>>>landing on
>>>>> the moon just a legend.
>>>>>
>>>>> I'm sure there will be religion, and come 200 years no one will know

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>>>>any
>>>>> different, our high rise buildings will be grottos of that mysterious
>>>>past.
>>>>>
>>>>> Since there will be no more fossil fuel no future men will have any
>>>>energy
>>>>> to recover from this fall and will be the same until the end of the
>>>>world or
>>>>> the extinction of man.
>>>>>
>>>>> I will not be there, I will not know, my days are numbered, soon I
>>>>will be
>>>>> no more than well, no one will remember me and there will be no
>>>>record of my
>>>>> existance.
>>>>>
>>>>> My extinction is assured, nothing of me will remain, in just a short
>>>>time.
>>>>> I may choke as I have a chest infection with a choking phlem and
>>>>heart
>>>>> disease with a good chance of heart failure or heart attack, or I
>>>>might just
>>>>> have a stroke.
>>>>>
>>>>> There is only one way of living and so many ways of dying. I might
>>>>just
>>>>> take up religion. The cult that offers immortality, which one was
>>>>that? Is
>>>>> it genuine? Who is telling the truth?
>>>>>
>>>>> Chris.
>>>>>
>>>>>I am sorry for your misfortune, however, in reference to the rest of
>>>>your predictions, piffle. things are on track for a very bright future
>>>>globally. there will be small local problems, but no grand catastrophe
>>>>is in the offing at all.
>>>>
>>>>>Sorry, Chris is pretty correct. The world cannot support more than about 3
>>>>billion humans without oil.
>>>>>
>>>>>Nearly all the wars in the past 30 years have been fought over oil, There are
>>>>more to come.
>>>>>
>>>>>There is no substitute for the vast, fossilized accumulation of solar energy
>>>>that one horrible little animal will have squandered in 150 years.
>>>>>Those who think there are substitutes simply haven't done their sums.
>>>>>
>>>>>In twenty years time, the standard motor vehicle will resemble a solar powered
>>>>golf cart. It will have PV cells on the roof and the owner's house will be
>>>>covered with them.
>>>>>

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>>>Trouble is, this wont work in cold climates during winter. Nor will there be
>>>anywhere near enough pure silicon to produce the 500,000 sq kms of required
>>
>> You're totally wrong about 500,000 sq kms. I'll bet you're
>>comparing apples to oranges.. Electric output verses thermal.. Those
>>are two different animals. Electricity is far more useful than raw
>>thermal power. For general heating applications electricity can run
>>heat pumps yielding 3 to 5x useable heat transfer per unit of energy.
>>
>> ppt presentation(slide 24) below indicates that about 18,000 sq km
>>(20x(30^2) sq km) would be enough to replace the 3,800 billion kWh of
>>electricity produced in US in 2000.
>
>Wishful thinking.

The figures are in the presentation..
Existing 18% MC solar tech will fit the bill. Triple junction
Solar cells run in excess of 35% efficiency.

Alternate solar thermal tech could provide even more efficiency. .
<http://www.stirlingenergy.com/>

Conservation could provide the electrical energy we need to
displace the much of energy used for transportation.. I.E. 20%
electric savings could displace 80% fossil fuel used for
transportation. New electric transportation system would be roughly
15 times more efficient.

>Multiply that by ten.
>Then multiply by 3 to make allowance for transport and machinery.

No.. you're way off..

Solar tracking isn't all that difficult, it spread out the arrays
somewhat more more(3x) land, 30% fewer panels. Not all that much
material is needed. Most atmospheric stress wear, and tear will occur
on the arrays located on the perimeter.

As for materials.. the selected building sites have an abundant
supply of suitable construction materials (sand also known as SiO2) .
Fiber glass batting (woven form of SiO2), Protective Glass (melted
form of SiO2), solar cell material (Si). Plenty of thermal energy
avail on site. Carbon based content is relatively minor.. (Resin
for fibre glass, wire insulation). Al content not all that much.

Foundations can be made out of sand anchors. 10 M^3 buried open
frame tank filled with sand. (simple, cheap, easy to built on site)..
Dual axis trackers don't need to be perfectly vertical to perform
their function.

DC transmission is way more efficient than old AC methods. Smaller

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towers.. 3x less wire,. Recycling existing Al power lines & steel towers will supply most of the needed materials.

P.S. Don't forget about all the scrap material made out of 200 million obsolete cars, power plants, pipelines, railroad tracks & cars, bridges, refineries, tank farms, etc.. :-)

>
>>
>>>cells, which incidentally will have anything from 4 to 10 years energy payback
>>>time.
>>
>> Long distance HVDC transmission lines 5000km in length are roughly
>>75% efficient. Yes, we can pipe solar energy from the desert SW &
>>Florida to New England.
>
>You will soon have to....or all move south.

No.. just shift the work day slightly to match primary power generation.

>
>>
>>>some links on HVDC transmission..
>>
>><http://cohesion.rice.edu/CentersAndInst/CNST/emplibrary/Hartley%2004May03%20NanoTechConf.ppt>
>>slide 24.
>
>In practical circumstances, PV wont produce anything like 14%.
>The figures for insolation were for surfaces normal to the sun.
>Include the cosine factor too....
>
>>
>> The case has been made that transporting electricity via HVDC is
>>more efficient than transporting energy via gas pipelines or using
>>railroads and then turning it into electricity supplied to local grid.
>>
>>>
>>>Ethanol production will require 10 times the Earth's total land area to even go
>>>close to replacing oil.
>>
>>Li-ION battery charge efficiency is upwards of 95%..
>> which is far greater then Lead -acid 75%
>> and NiMH 60%
>
>they will be needed in huge quantities.

Soo... making 15 millions cars each year requires a huge amount of resources..

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I don't think 10 to 100 kg of battery technology is going to be all the difficult to manufacturer. Consider that we're displacing 800 to 1000kg of power plant and related weight by removing the ICE from the equation.. I.E. (no fuel tank.. no catalytic converter, no radiator, no muffler. no starter, no generator, no transmission, no need for power steering, power brakes, etc.. + chassis weight reduction by removing all that mass.. smaller springs, shocks, tires, brakes..etc.)..

Average car will weight less than 1/2 ton after the conversion to electric only usage..

>

>Where will all the materials come from?

>Where will the energy required to make all those batteries come from?

See above.. factor in the displacement of other materials..

Perhaps by recycling the old cars into 3x the number of replacement electric cars.

>

>>

>>ref see page 18..

>>http://web.mit.edu/2.009/www/lectures/15_Batteries.pdf

>>

>>

>>-----

>>

>> Usable work derived from a barrel of oil in our transportation

>>system ranges from 5%(cars) to 15%(trains+ships). (It's a rough guess

>>after you add up all the intermediate losses).

>>

>> So we have a lot of room for improvement in the transporation

>>arena; which consumes roughly 50% of our total energy consumption.

>>

>>Notes: Hydrogen isn't a practical alternative.. Around 18%

>>efficient. Energy distributed by electric grid + Li-ION bat tech has

>>4 to 5x advantage in overall efficiency. (80 to 90%)

>

>Electricity production is very wastful of energy.

??? not really.. it's one of the most useful forms of energy we have..

>At best about 38% effecient.

Efficient ?? for what??? thermal to electric?

electric to thermal? electric to mechanical?

>We need to avoid using fuels to produce electricity.

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Actually .. Generating usable mechanical energy is wasteful step.
Mechanical to Electric conversion and vice a versa is roughly 90 to 95% efficient. Skipping the initial mechanical process using solar generation is a big step in the right direction..

>>

>>ref (h2 energy cycle).

>><http://www.arts.unsw.edu.au/tsw/D91.RE.Ch.6.Hydrogen.html>

>>

>>

>>>Other forms of renewable energy are just drops in the ocean compared to the
>>>chemical energy contained in oil.

>>>

>>>To put it mildly, the human race is well and truly stuffed.

>>

>>

>> With the right guidance and political will power... here is one
>>possible future for the US.

>>

>> Much of this plan can't be accomplished using profit as the sole
>>motivation. (P.S. It's far more profitable for MN corps to squeeze
>>every last dime out of the citizens and then run away to another
>>country.)

>

>I suspect that capitalism will fade away when the energy runs out.

>

>

>> Keep the existing nukes.. We might double up nukes using
>>per-eixsting sites provided it doesn't adversely impact environment
>>with too much localized thermal output.

>

>Nuclear power will be employed to a maximum.

>

>>

>> Required solar roofs in sunny climates + large solar installations
>>in deserts. Wind power harnessed were practical.

>>

>> Remote generation of electric power .. transported to load via HVDC
>>lines. Convert coal to electricity were it is mined. (Coal used
>>only when climatic conditions require it's usage.)

>>

>> Wide scale usage of electric only cars.. using existing Li-ION or
>>maybe future Si-C (10x more E/kg) or Li-Si(30x more E/kg) bat tech.
>>Rented, Fossil fueled APU's on towed trailers for long distance
>>traveling. (Not needed if Li-Si BAT tech is perfected. A 20 kg Li-Si
>>240Kwh battery would give an EV a ~2400 mile range!!!)

>>

>> Car's normally charge at home&work, with on demand reverse cycle
>>for load leveling. (While connected to grid.. Some percentage of
>>stored energy in vehicles could be returned to power grid when
>>needed.)

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>>
>> Daily lifestyle changes to match avail energy generation.. East
>>coast might not start it's work day until after the sun has risen in
>>the Desert SW. (10am to 6pm, etc). North West (8am to 4pm) etc...
>>
>> Required telecommuting in lew of travel to work place. (Requires
>>that we get a handle on off shoring through laws restricting
>>information flow, otherwise MN corps will abuse laws to further
>>damage the local economy).
>>
>> WARNING... unkind words about MultiNational Corporations follows.
>>Any laws and government expenditures must first and foremost benefit
>>the citizens and local econ, MN corps can go to hell. MN corps
>>should probably be taxed out of existence as a penalty for getting the
>>U.S. into this mess.
>
>All these measures will be introduced in the near future....plus a lot more.
>
>>
>> Immigration and border control. Requires a relatively fixed
>>population. We can't keep on adding more people into the energy
>>demand side forever. US citizens have demonstrated that they have
>>willingness to control pop, illegals are another story. Additionally
>>the solution needs a stable and secure society to maintain
>>infrastructure once it is built. I.E. Can' t have disenfranchised
>>radical elements blowing up HVDC transmission towers.
>
>World population control is essential if the human race is to survive at all.

• *Follow-Ups:*

- ◆ **Re: Oil replacement**
 ◇ *From:* Alex Terrell
- ◆ **Re: Oil replacement**
 ◇ *From:* Dean Hoffman

• *References:*

- ◆ **Oil replacement**
 ◇ *From:* Chris
- ◆ **Re: Oil replacement**
 ◇ *From:* Mel
- ◆ **Re: Oil replacement**
 ◇ *From:* tesseract
- ◆ **Re: Oil replacement**
 ◇ *From:* Chris
- ◆ **Re: Oil replacement**
 ◇ *From:* bill
- ◆ **Re: Oil replacement**

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◇ *From:* Tim Keating

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