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It's Not Easy Be(com)ing Green...

PV – where in the world is it going?



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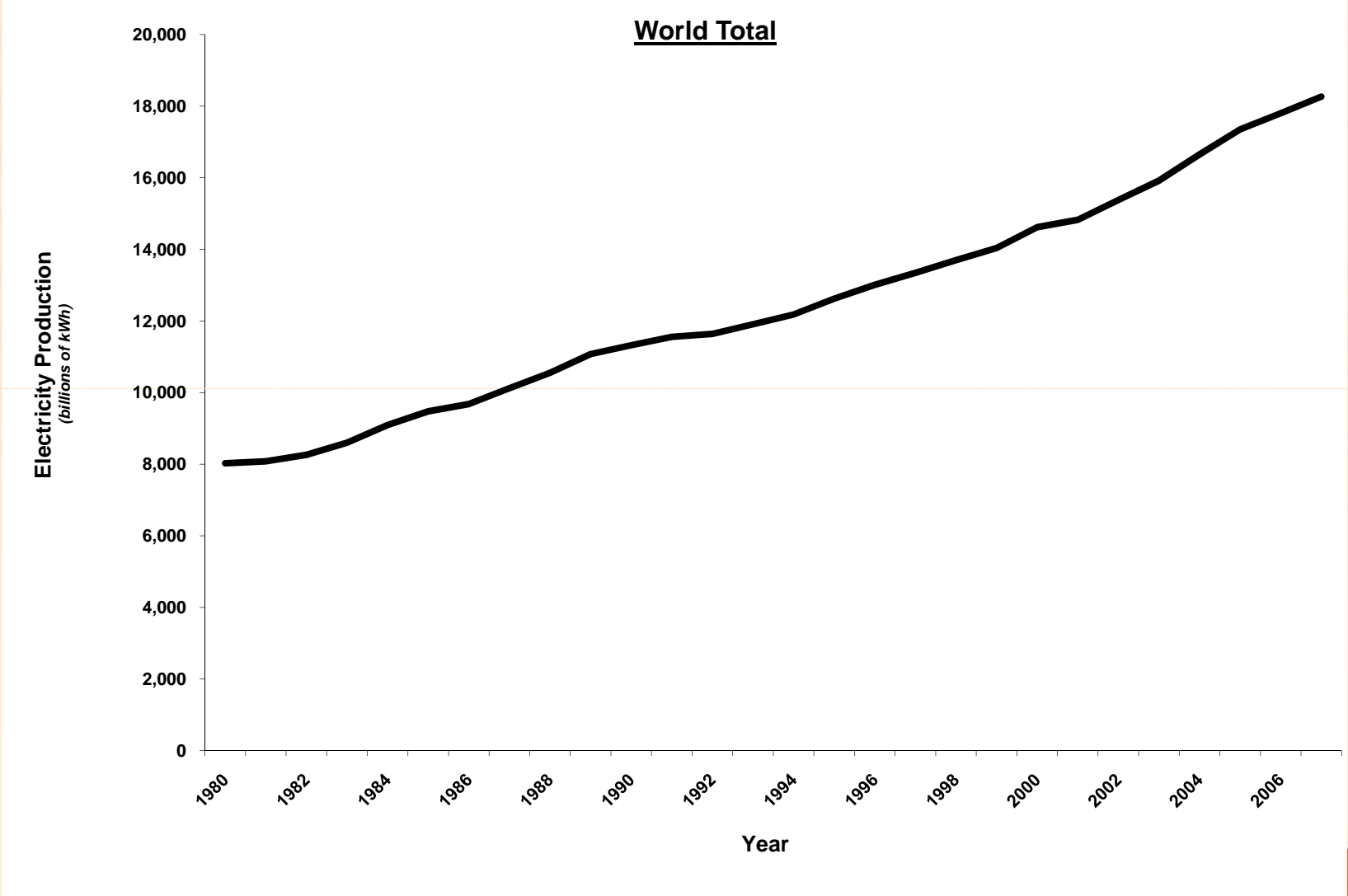
EPV Solar, Inc.

What Is PV All About?

- *It's not about*
 - *modules, or systems, or anything else...*
 - *It's not even about **WATTS** – which is what everyone likes to talk about*
- ***It's about Electricity - kWh***
 - *Capacity doesn't light lights, run appliances, power computers, or anything else worthwhile*
- ***Energy does***
 - *Installed PV is worthless if it doesn't produce kWh!*
- *So – let's take a look at electricity*



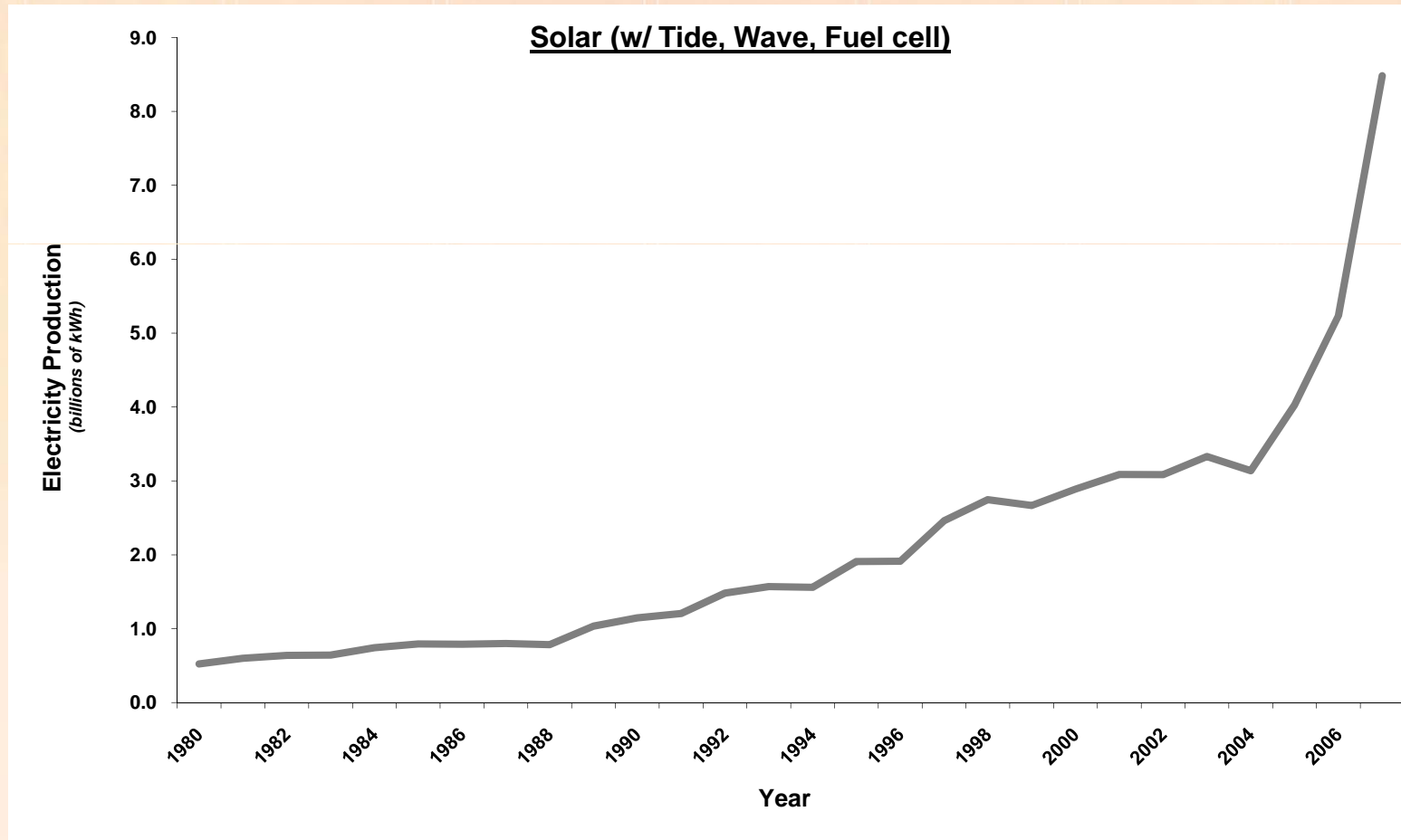
World Electricity Production



What Has PV Done So Far?

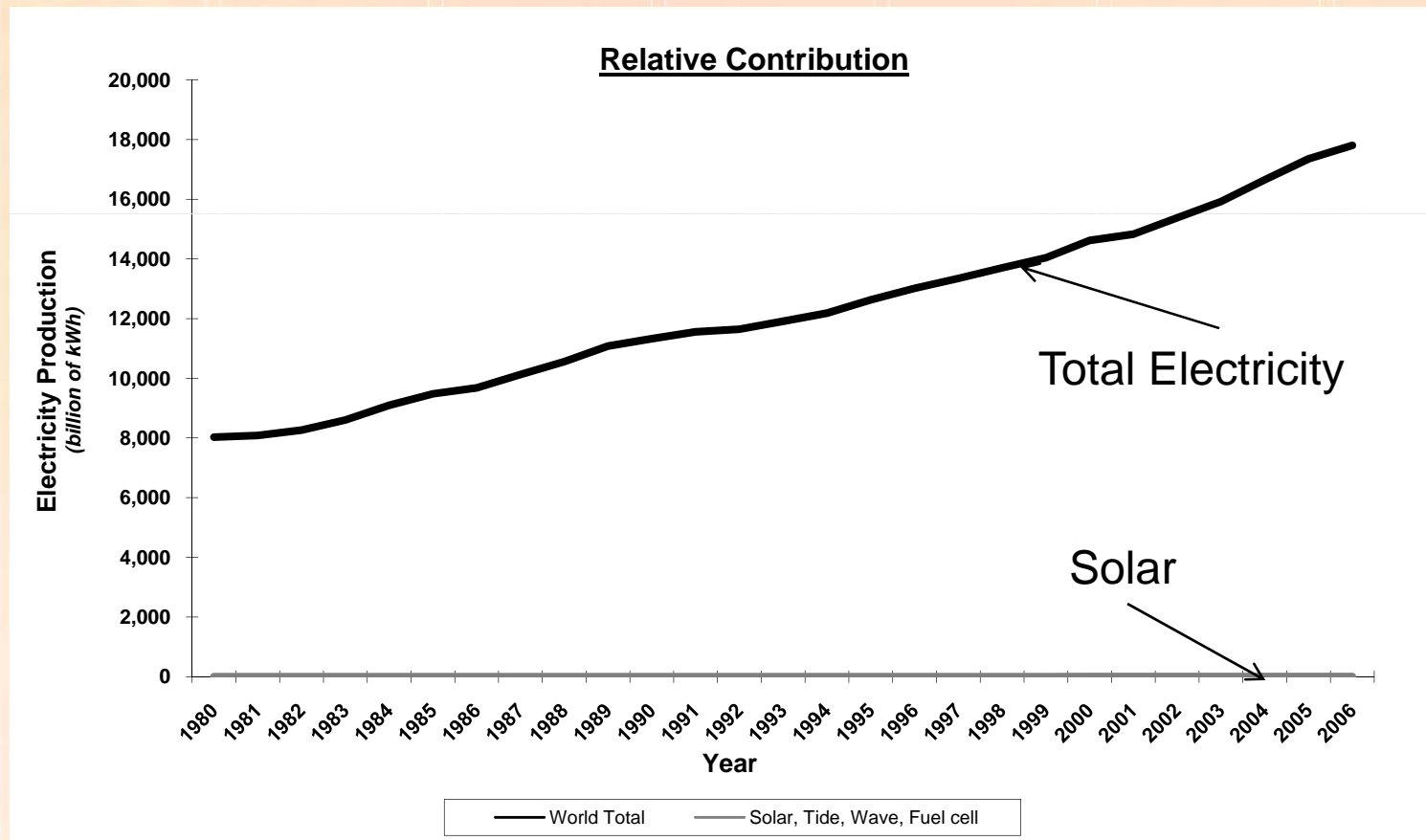
- *World PV* Electricity Production*

** including tide, wave, fuel cell (collectively not significant)*

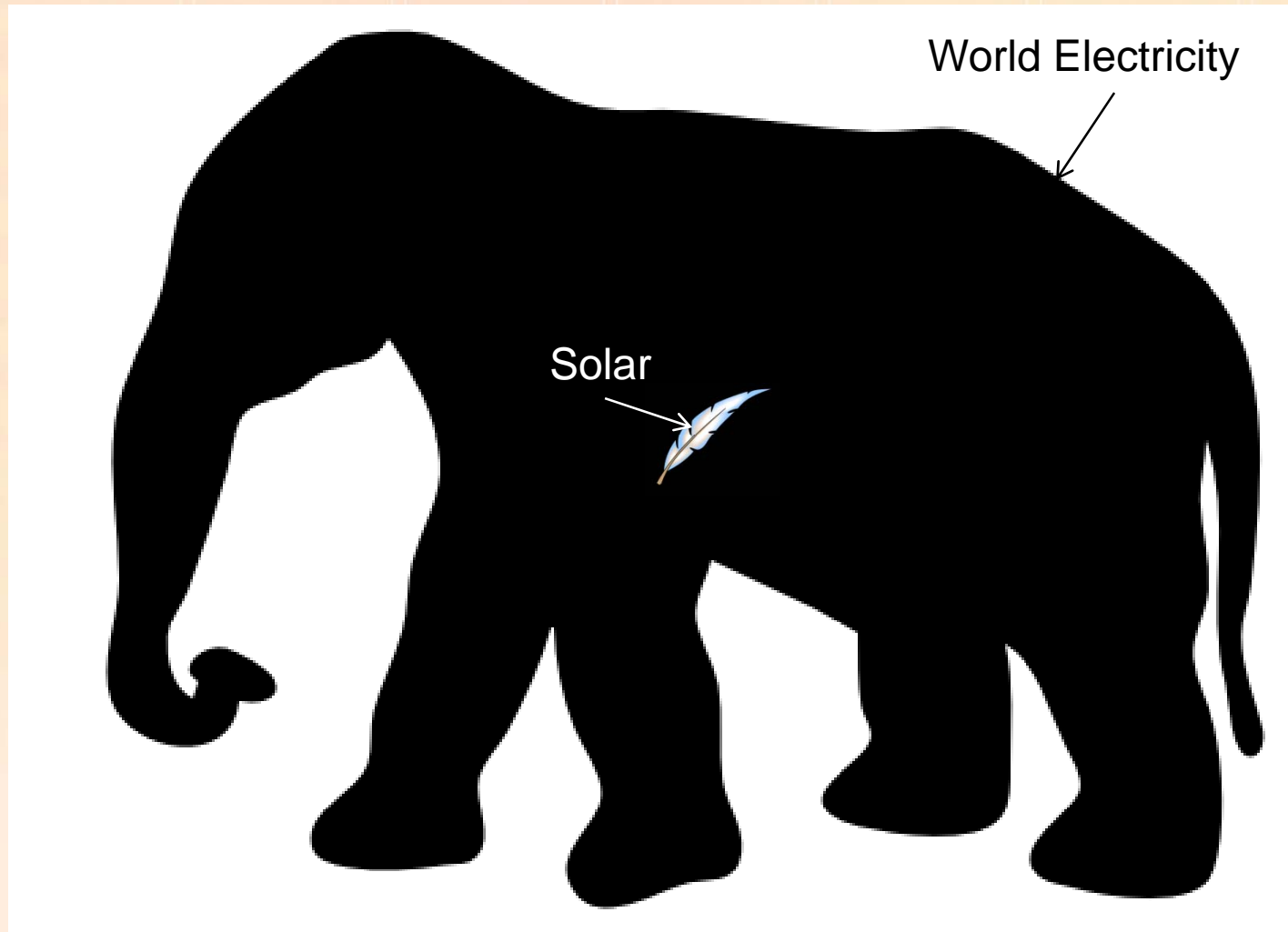


How Is PV Doing?

- *In 2005, PV's contribution to world electricity was 0.023%!*



PV Is Just Tickling the Elephant!



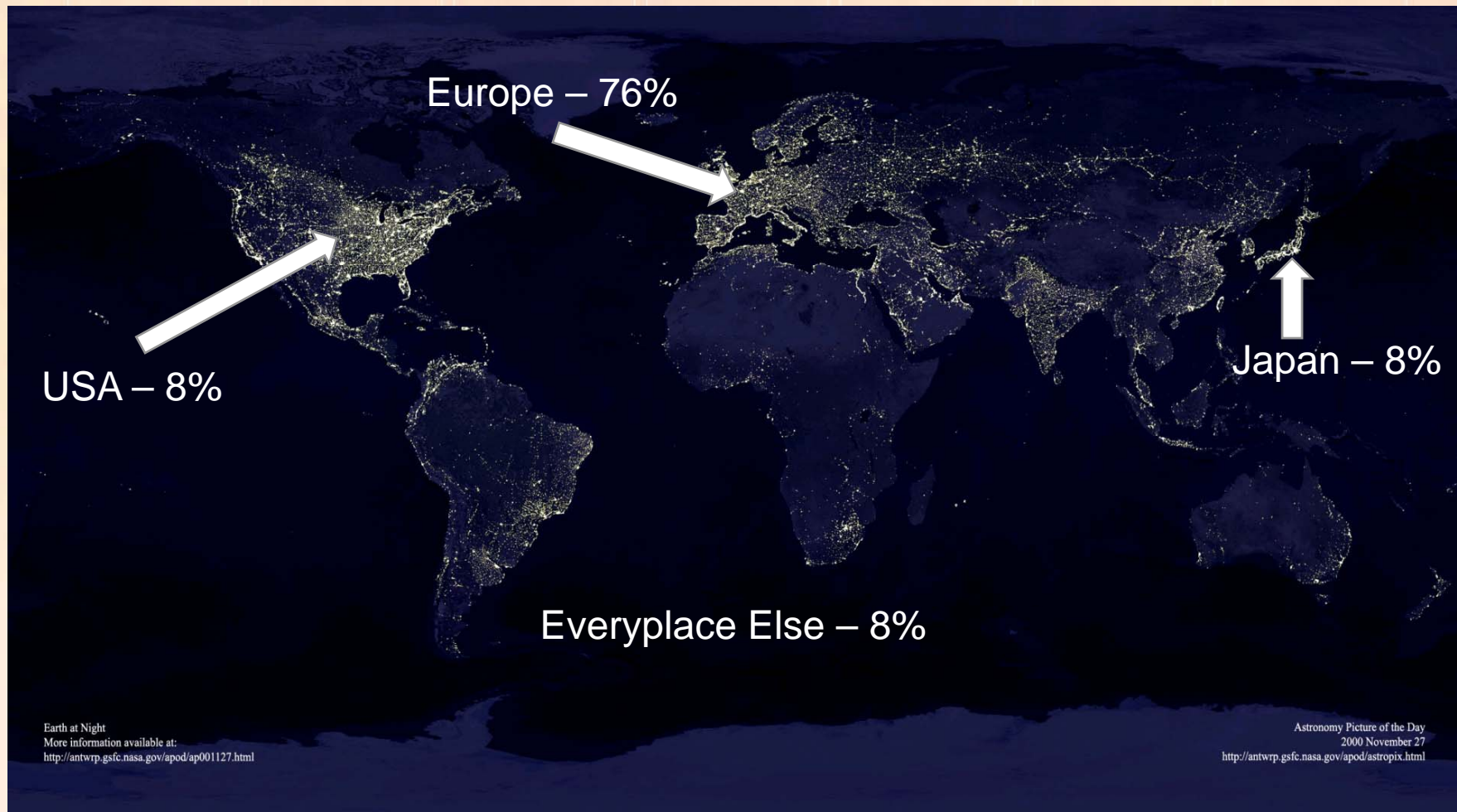
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Can PV Become Meaningful?

- *If world production grows at 2.6% per year (as suggested by the Energy Information Administration), and*
- *PV production grows at 40% per year (probably an unsustainable rate, but who knows?),*
 - *by 2020 PV would still be less than 3% of total electricity production*
- *Similar projections for the US would result in PV providing not quite 2% of total electricity production*

The World At Night

- *Where is PV capacity being installed? In 2007,*



Africa – The “Dark” Continent

- *In Sub-Saharan Africa, more than 500 million people lack modern energy*
 - *Rural electricity access rates are less than 2%*
- *The poorest of the poor spend 10-15% of total income on energy*
 - *Annual expenditures are estimated at nearly*

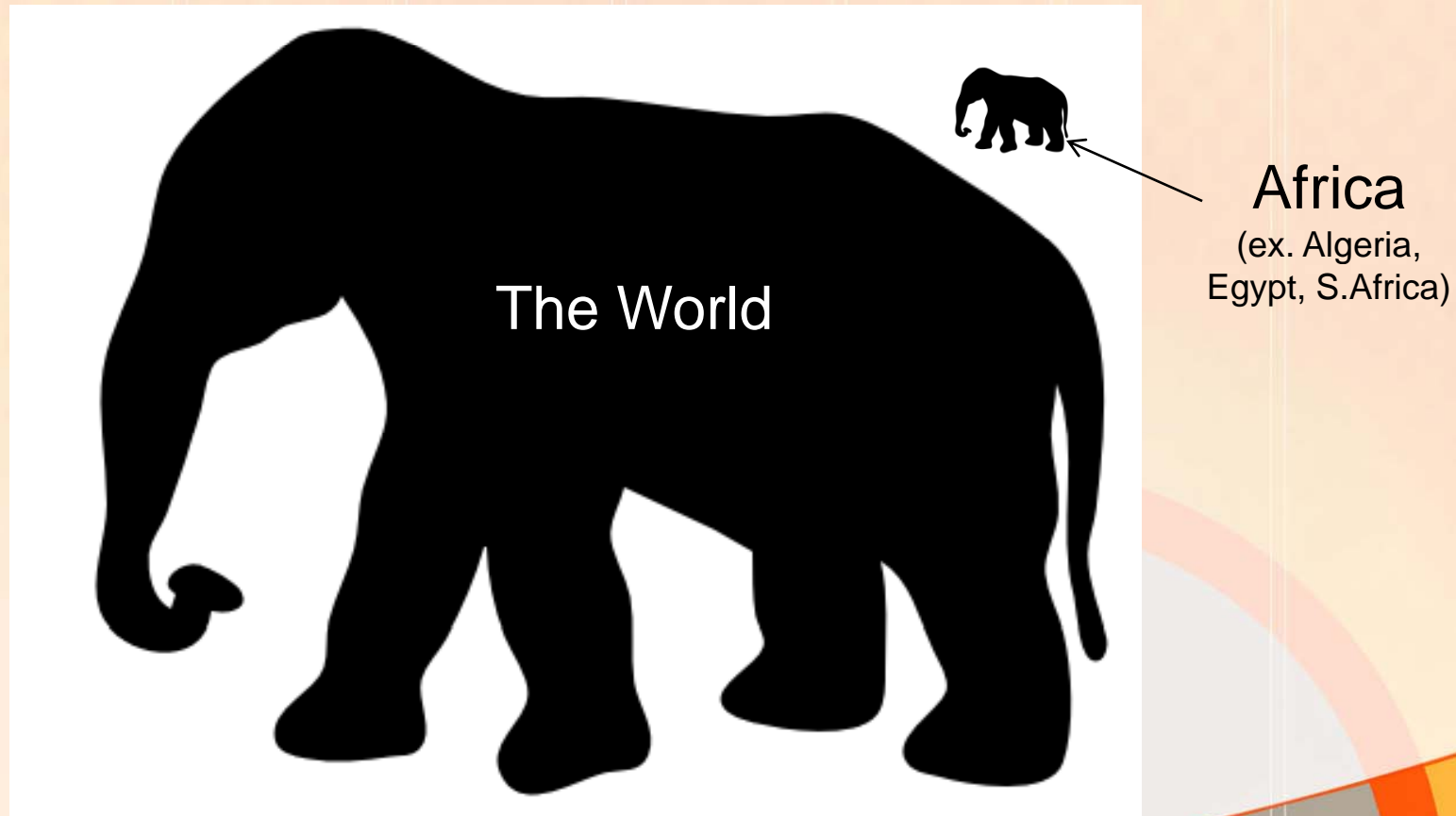
\$40 billion

- *Affordability is not the issue*
 - *PV electricity is competitive – and, in most cases, less costly – than traditional sources*



What Impact Could PV Have?

- *For starters, the “elephant” is smaller – MUCH smaller*



The Economics Work

- *In the industrialized and developed world, where more than 92% of PV capacity is being installed, incentives and subsidies make the economics “work”*
- *In the developing world, the economics work already*
 - *PV is an economically superior choice when compared to most alternatives for electricity and/or lighting*
- *Added benefits are environmental, political, and social*



Why Isn't It Happening?

- *Until recently, fossil fuels were “cheap”*
 - *Relatively low initial capital requirements; no environmental “cost”*
- *Government policies focused on building up national grids*
 - *Off-grid was considered second class*
 - *No one wanted to tell voters they weren't going to get “real” electricity*
- *Large gas, coal, and hydro projects offered the prospect of cheap electricity, deterring renewables and conservation*

Where Could EPV Solar Fit In?

- *EPV Solar is a manufacturer of amorphous silicon (a-Si) thin-film PV modules*
 - *In most of the developing world, a-Si technology is a perfect fit*
- *EPV Solar's a-Si manufacturing technology and process is well-suited to support local module production as the market develops*
 - *Creates benefits such as jobs, “staked” users, positive financial impact*

Is There a Way Forward?

- *Need for off-grid (and mini- and micro-grid) resources is growing*
 - *More than 8 MW of PV has been installed in the telecom sector in Ethiopia*
 - *PV is becoming the preferred – low-cost – method for off-grid customers to charge phones*
- *Telecom development has demonstrated the ability to formulate good businesses that meet a serious local need – and do so profitably*

My Goal

- *Develop and implement a “delivery” system*
- *In my dual role as an independent businessman and a Senior Advisor to EPV Solar, I’m*
 - *Assessing what’s been done, what’s worked, and what hasn’t worked*
 - *Developing contacts with local experts*
 - *Formulating a plan of attack*
- *Expecting to organize a multipronged support network that will include*
 - *industrial participants*
 - *NGO and donor support*



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