A decentralized, consumer-driven model for the solar eco-system

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The transition from fossil-fuel based energy usage towards renewable energy sources needs to be accelerated. Where financing is available, very few “bankable” projects exist for global investment.  

To hasten the transition, a new decentralized, consumer-based renewable energy approach must be adopted. Solar energy technology is particularly suited for this and can see early gains for climate change. The G20 can create policies to help develop products for consumers and facilitate global private capital and multilateral finance towards this goal.

Challenge

1. The transition from fossil-fuel based energy usage towards renewable energy sources needs to be accelerated

   Renewable energy comprised 2.8% of global energy consumption in 2015[1]. Despite improvements in technology and natural advantages over conventional energy, the adoption is not growing fast enough to meet the global commitments to climate change[2]. The key challenges are:
   - Availability of appropriate products, which can be easily and widely adopted by consumers
   - Where products do exist, market distortions make them financially unviable

2. Financing deficit for renewable energy infrastructure

   Particularly true for developing economies. The $100 billion per annum Green Climate Fund is grossly insufficient to meet the goals, and under 10% is committed[3].
   - Lack of specialized financing for both small and large-scale solar purchases
   - Lack of a secondary market – a key enabler for consumer finance for small-scale solar products

Proposal

Recommendation: Convert solar power into a consumer product and channel global investments towards decentralised, retail solar infrastructure projects.

Part I: Encourage development of solar-based consumer products

- Encourage renewable energy companies to design standardised home products that can easily be purchased and installed by consumers. Solar panels and systems are not designed for small scale installations. For instance, installing a home solar system requires technical expertise for gauging orientation and connecting electrical circuitry – similar to mega-solar installations. Existing models are unwieldy[4]. Required instead are panels that are as easily installed as other consumer appliances such as refrigerators and televisions.
- Encourage global use of electric vehicles. There is a distortion to overcome: in most developing countries, the electric grid carries subsidised, coal-generated power. Consumers therefore don’t pay market rates for a unit of energy, making it difficult to substitute. Petroleum, on the other hand, is up to five times more expensive for consumers, as it is often aligned to global market prices. Therefore, a better policy will incentivise consumers to substitute petroleum with solar, instead of coal for solar. A viable option is a combined Solar-Electric Vehicle model that provides an immediate and greater monetary benefit to consumers. This is not the Tesla, Leaf or Bolt model[5], but more in line with the dominant mode of transport in the emerging world, the two-wheeler which is suited for home-solar recharging[6]. This encourages the use of renewable energy to mitigate the negative effects of carbon emissions from power generation and from transport. Consumer financing companies will find this more attractive because vehicles (as opposed to used home solar systems) have a ready resale market, should there be loan defaults. This solution will require research and investments in higher capacity batteries and public charging points.

Part 2: Direct global long-term savings towards solar consumer finance.

- Create specialised consumer financing for decentralized solar products. Specialized consumer solar finance intermediaries are needed to create markets for solar products in the image of automobile and home finance providers. These companies may require initial equity investment, as well as access to cheap, long-term debt capital to operate effectively. Such retail loans can be bundled and resold to global financial institutions and investors interested in renewable energy.
- Encourage multilateral banks and global private capital to invest in such consumer finance companies instead of looking for bankable renewable energy projects around the world to fund; global investors will find it easy to fund specialised consumer financing intermediaries (as described above) with experience with retail banking, which follow global accountability standards, and are monitored by national regulators.

PROPOSAL: A DECENTRALIZED, CONSUMER-DRIVEN MODEL FOR THE SOLAR ECO SYSTEM

WORLD
GLOBAL INSTITUTIONS

COUNTRY
INTERMEDIARIES

CONSUMERS

Households
Proposal: A decentralized, consumer-driven model for the solar ecosystem

Country examples:

- India has taken the lead[7] on renewable energy, particularly solar, to meet its global and national climate change goal. However, despite solar energy being cheaper than nuclear, hydro and natural gas, and nearly on a par with that produced by coal[8], only 2.4% of the country's total solar energy installation is residential rooftop solar[9]. Getting loans for such small scale systems is difficult, as is installing and implementing net metering. An experiment is already under way: Multilateral support has come from the World Bank which has initiated a $1 billion distributed solar programme for India called the Grid-connected Rooftop Solar Photovoltaic (GRPV) Program, financed via India’s largest public-sector bank – the State Bank of India[10].

- Bangladesh has the most successful large-scale adoption of small-scale products – 3.7 million solar rooftop systems – through World Bank support[11]. However, these are extremely low capacity, just 10-watt and 20-watt systems[12]. While these help the marginalized get electricity, the overall impact of replacing fossil fuels is negligible.

- Germany has nearly 40 GW megawatts of installed solar capacity, of which 30 GW is in solar rooftops[13]. Nearly 1.5 million small scale solar systems have been installed, with subsidies from Berlin, and created an estimated 38,000 jobs[14]. The European Commission has pushed for a move to market based mechanisms[15].

- The U.S has an estimated 32 GW of installed solar capacity, of which 13.2 GW (41%) is small scale[16]. In 2014 and 2015, renewable energy (solar and wind) accounted for more than 50% of the new electricity generation in the country[17]. Net metering has been an important enabler for encouraging distributed solar, and the market has been catalysed by permitting leasing[18].

- At 35 GW, Japan has the world’s third largest installed solar generation capacity, post Fukushima. High subsidies have enabled adoption[19], but it is unsustainable and creates market distortions.

References


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Existing Initiatives & Analysis

Implementation Overview (3)
The best models are market-based.

Three such are implanted, with uneven results:
• The U.S. model is market-based and successful at home but not replicable elsewhere
• Germany and Japan rely heavily on energy subsidies; unsustainable
• Bangladesh’s 10MW-20MW products are not viable for mainstream use

Adoption in India suffers from lack of institutional support, market distortions and lack of consumer finance.

Existing Agreements (9)
The G20 does not have any policy guidelines on decentralized solar infrastructure. It was barely discussed at G20 before 2015. The G20 energy ministers met for the first time in 2014 and released the G20 Principles on Energy Collaboration (16 November 2014). This document does not mention decentralised solar. It states “Support sustainable growth and development, consistent with our climate activities and commitments, including by promoting cost-effective energy efficiency, renewables and clean energy” Prior to this, meetings on environmental cooperation have spoken about the use of renewables and the need to reduce emission of GHGs. However, none of the communiques mention the idea of decentralised solar or the innovative consumer financing models.

At the G20 summit in 2014, Indian Prime Minister Narendra Modi said, “Let us make an ambitious and innovative effort to make renewable, especially solar energy, competitive with conventional energy. In Gujarat, the canal-top project worked well and saved water, too. We should also discuss innovative funding models to ensure rapid expansion of renewable energy in decentralised manner in rural areas”.

Since 2015, the concept of decentralised solar infrastructure and the idea of looking for alternative sources to fund green infrastructure projects has been discussed.

1. G20 communique from the Energy Ministerial meeting in Beijing (2016) refers the following documents:
More Information

• G20 Voluntary Action Plan on Renewable Energy
More Information

• G20 Toolkit of Voluntary Options on Renewable Energy Deployment
Good practice exchanges on (i) enabling national policy framework design and (ii) power systems integration of higher shares of variable renewables

• G20 Energy Efficiency Leading Programme (EELP)
Further strengthening the outlook for international collaboration on energy efficiency

2. Enhancing Energy Access in Asia and the Pacific: Key Challenges and G20 Voluntary Collaboration Action Plan
Community Participation, Decentralized Energy Systems

Options that G20 members could embrace to support electricity access in sub-Saharan Africa