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International and national renewable energy for electricity with optimal cost effective for electricity in Egypt

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ABSTRACT

Electricity is the fastest-growing final form of energy. The strong growth of renewable in many countries raises their share in global power generation to one-third by 2040 [1].

Lack of access to electricity is one of the biggest troubles facing the world's poor, with over 1.6 billion left in the dark globally. The substantial majority of human beings live in rural areas of developing countries which is too far away to be reached through the national grid. For their lighting needs they depend on candles, kerosene lanterns, and firewood* This consequence in an each day rate that is high priced in the long run. Long-term, solar energy is the most practical and low-budget way of bringing power to far flung communities. Small-scale, distributed solar home systems provide an effective and affordable way to bring light to people without electricity.

Egypt's electricity use has been growing swiftly as a end result of economic growth in the closing decade. However, Egypt has a massive of its populace residing in rural areas access to energy is still a challenge. The power sector is key to Egypt's monetary development and poverty decrease goals.

This paper represents support sustainable livelihoods for rural communities. The paper refers to renewable energy for rural populations with no access to centralized electricity power. The focus is on solar electrical energy and its economic applications for village electrification. The Paper goals to compare between electrical energy cost (kWh) using PV panels, diesel generator and the end of result suggests the cost of 1 kWh from the PV system is less than diesel system for rural residential electricity are 0.22$/kWh and 0.5$/kWh respectively.

1. Introduction

Access to electricity is a simple requirement for the achievement of economic increase and human development objectives. 1.6 billion people lack get energy, 5% in Latin America, 8% in Middle East, 17% in Asia [2]. Fig. 1, the greater than 620 million people, in sub-Saharan Africa, or more than two-thirds of the population, live without electricity, Fig. 2 [3]. While the African continent is home to about 1 billion people, solely 4% of world electrical energy is generated there. With a total set up capability of roughly 147 GW, Africa has much less power generation potential than Germany [4]. All forty seven sub-Saharan countries (excluding South Africa) have a combined hooked up renewable technology capacity of solely 23 GW, which is much less than one-third of the whole renewable energy capability hooked up in India. In addition, as the population is rising, the range o f human beings in sub-Saharan Africa besides get entry to clean cooking additionally has risen—by about 2.7% per year between 1995 and 2012, the number of people using traditional biomass is expected to remain constant or could even increase to 2.7 billion by 2030 because of population growth (IEA, 2006) [5,6]. and the average consumption in sub-Saharan Africa is about 317 kWh per year — or less than a modern American refrigerator. This trend is expected to continue [7,8].

Gross domestic product per capita and energy per capita will stay lower in most of the developing international locations than in industrialized international locations over the next many years [10]. Moreover, it is feasible that the variety of people who lack get right of entry to toelectrical energy should enlarge over the coming months due to the fact of the employment and profits results of the global monetary recession and the surge in food prices. This is compounded by means of the steep fluctuations in the price of fuels. At the identical time, extra constrained domestic budgets in creating international locations and a consequent discount of public spending for the enlargement of country-wide electrical infrastructure and potential should prolong or even reverse progress in quotes of electrification [10].

Clearly, electricity demand and provide patterns both need to be altered. This is a essential project that needs complete and sustainable solutions. In this context, the importance of renewable power (RE) is past dispute. Clean electricity technologies are necessary to alleviating

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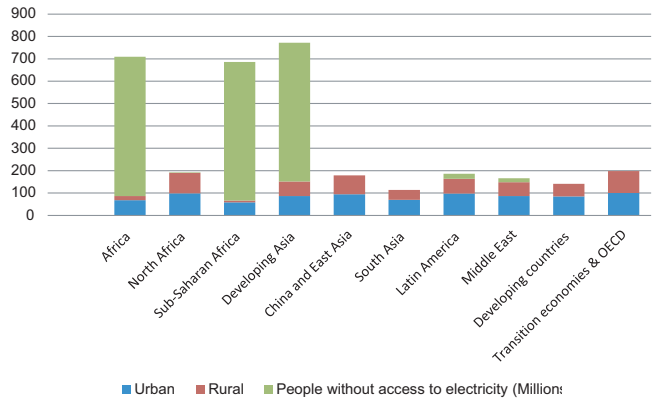

Fig. 1. Access to electricity, by urban and rural areas (percent), by region and country in 2012 [9].

poverty, increasing rural development, and retaining environmental quality. Most of the boom in electrical energy technology would come in hydropower and natural gas, even though solar energy would additionally develop significantly. Table 1 shows electricity generation by fuel in sub- Saharan Africa, 2010–2040.

2. World renewable energy based power capacity

In 2014 towards the backdrop of increasing international energy consumption and a dramatic decline in oil cost the renewable energy persevered growing [13]. International final energy consumption has increased by about 1.5% by using rising demand in developing countries [14]. Over the length 2007–2012, renewable power era grew at an average price of 5.9%/year [12].

In 2012, Renewable energy provided an estimated 19% of International energy consumption, the most significant growth occurred in the power sector, with global capacity exceeding 1560 (GW), Hydropower rose by 4% to approximately 1000 GW, Solar PV has continued to expand at a rapid rate, with growth in global capacity averaging almost 55% annually over the past five years [15].

In 2013, Renewable energy provided an estimated 19% of international closing energy consumption, the levelised prices of electrical energy technology from onshore wind and, particularly, solar PV have fallen sharply. As a result, an growing variety of wind and photo voltaic energy projects are being built barring public monetary support.

In 2013, China, the United States, Brazil, Canada, and Germany remained the top nations for whole set up renewable electricity power capacity; the top nations for non-hydro capacity were again China, the United States, and Germany, followed by Spain, Italy, and India. Among the world's top twenty international locations for non-hydro capacity, Denmark had a clear lead for total capacity per capita. Uruguay, Mauritius, and Costa Rica were among the top international locations for investment in new renewable power and fuels relative to annual GDP [16]. Wind energy met 33.2% of electricity demand in Denmark and 20.9% in Spain; in Italy, solar Photovoltaic met 7.8% of total annual electricity energy demand.

In 2014, renewable energy generation capacity is estimated to have increased by 128 GW, of which 37% is wind power, almost one-third solar power and more than a quarter from hydropower Fig. 3. This amounted to more than 45% of world power generation capacity.

In the identical period, wind electricity met 39.1%, 27% and 21% of electricity demand in Denmark, Portugal and in Nicaragua, respectively; solar PV capability was once adequate to meet an estimated 7.9% of electrical energy demand in Italy, 7.6% in Greece, and 7% in

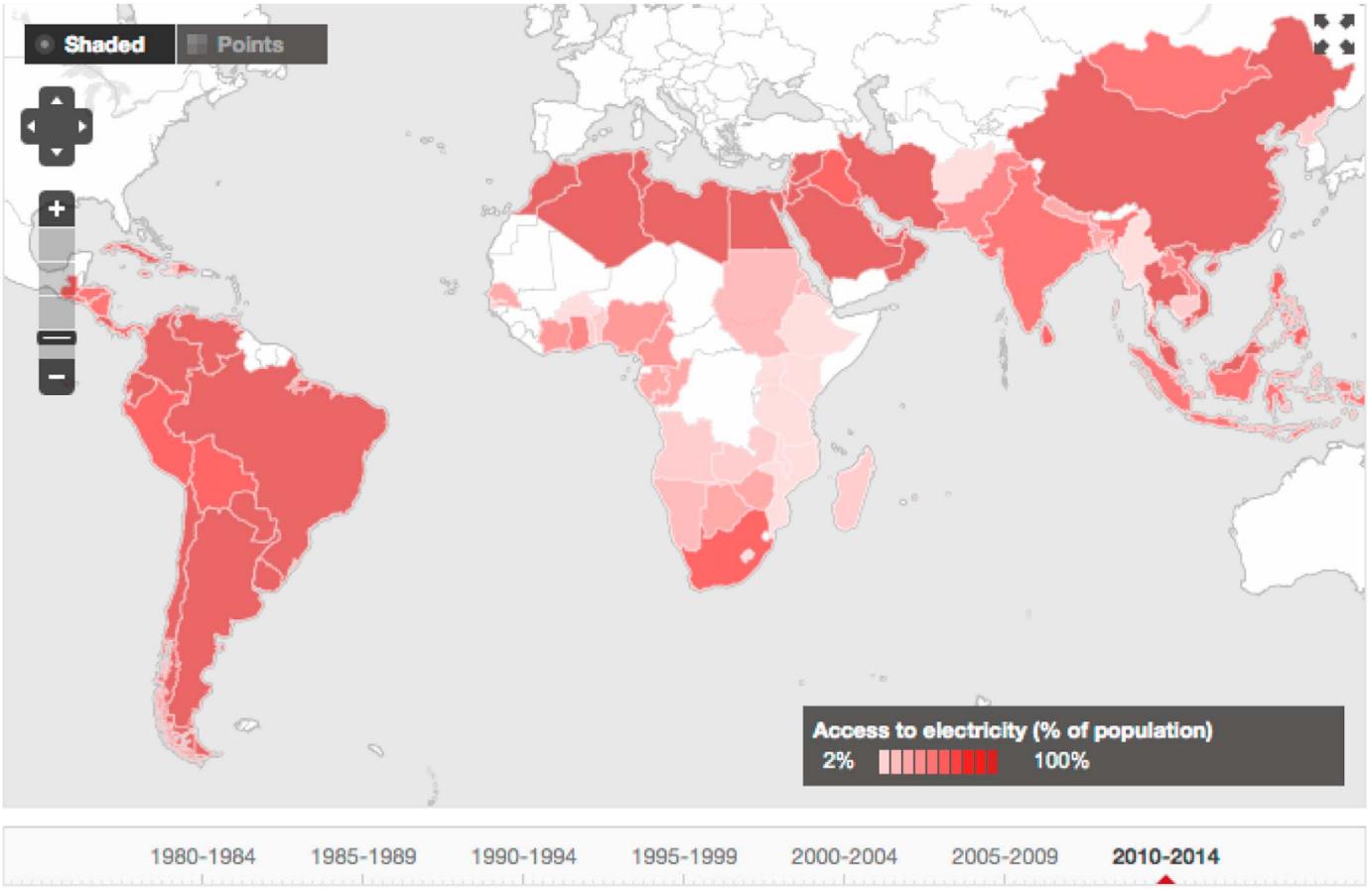

Fig. 2. A snapshot of electricity access in developing nations.