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The Predictable Future of Bio-Economic Society

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Abstract: This theoretic study aims to draw a picture of midterm future by terms of socio-economic environment. While doing this, we mostly assume ‘social structure’ as dependent variable and the ‘new economy’ (green energy and new production) as independent variable. As known, social transformations take more time due to the human generations lifespans, according to technological or economical transformations. In fact social factors effect economic and technological factors in long term deeply. But in this study we will be generally limited by the mids of 21. Century.

According to Jeremy Rifkin, great economic transformations in history appears when a new communication technology interact with a new energy system. New communication system make it possible to organize the more complex civilization, which the new energy system created. We are discussing the socio-economic future of human life on earth; how people will distribute on geography, how they work and how governments will change into new forms of social regulators?

IBM, Cisco Systems, Siemens and General Electric, are all trying to construct a smart power grid. This intelligent energy network will embrace virtually every facet of life. Homes, offices and vehicles will continuously communicate with each other, sharing information and energy on a 24/7 basis.

How this happenings effect the social community all over the world? With other entries like the rising of transnational enterprises, the individual independence on energy acquiring, will destroy the social contracts which establishes nations. Individuals normally gets together for creating economies of scale. Because individuals cannot build large energy plants like coal plants or nuclear plants by themselves. As a result governments become to loose their basic functional reason of existance againts citizens.

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1. Green Energy

In 1770's the usage of steam power ignited the first industrial revolution. About a hundred years later, electrification and electric based communication systems interact with internal combustion engine systems. This synergy ignites the second industrial revolution. Electrification of factories causes mass production. With the technique of Henry Ford, the vehicle inventory rised dramatically and an increasing demand for oil emerged.

Today we are at the dawn of a new interaction between new communication and energy systems. The interaction of internet technology and green energy creates the third industrial revolution. In the 21 Century billions of people will produce and then use their own green energy in their homes and vehicles and will sell the surplus to the demanders by clever electrification networks. EU intends to fulfil the one third of its energy from green energy by 2020's. (Rifkin, 2011)

While conventional fuels are getting scarce and expensive the acquiring cost of green energy are falling rapidly due to new technologic breakthroughs. The cost of photovoltaic electricity declines at a rate of 8 percent a year and by 2012 have reached the cost of conventional fuels. Now solar and wind installations are doubling every two years and are poised to follow the same trajectory as personal computers and internet use over the next two decades. The first inclination for getting green energy was to go to places where the sun allways shines and create great solar parks to collect the energy. Similarly, grab the wind where it's most abundant. But about 2006 a fundamental shift appeared on this understanding. (Rifkin, 2011)

The sun was shining on the every part of the earth and the wind blows all over the world. We all generate garbage. In other words unlike fossil fuels and uranium, which are elite energies and only found in certain regions of the world, renewable energies, are everywhere.

If so why should we try to collect the energy on specific locations? In this point scientists like Jeremy Rifkin began to give conferences especially in Europe about this new idea. In EU there are about 190 million building and all of them surface and roofs would be covered by photovoltaic generators and wind power generators.

Although renewable energies are abundant they come with their own unique problems. The sun isn't allways shining and the wind isn't allways blowing, or when it is blowing, it may not need.

In this case, storing the energy efficiently and cheaply is the better thing to do. Hydrogen fuel cells are going to be used for this. But after the usage of the building, how this stored surplus energy is going to be distributed?

1.1 Energy Internet

IBM, Cisco Systems, Siemens and General Electric, are all trying to construct a smart power grid. This intelligent energy network will embrace virtually every facet of life. Homes, offices and vehicles will continuously communicate with each other, sharing information and energy on a 24/7 basis. Smart utility networks will be connected to weather changes, allowing them to continuously adjust electricity flow also allowing dynamic pricing. The smart grid will be the backbone of the new economy. This network will may be 100 times

greater than the internet. Some homes have internet, some's not. But everyone has electricity.

How this happenings effect the social community all over the world?

- The energy costs will decline on behalf of developing countries as the knowledge access cost decline with internet.
- This progress also will change the political and economic balance of power in favour of developing countries which are dependent by terms of energy sources to other forces now.
- With very other entries like the rising of transnational enterprises, the individual independence on energy acquiring, will destroy the social contracts which establishes nations. Individuals normally gets together for creating economies of scale, because individuals cannot build large energy plants like coal plants or nuclear plants by themselves. As a result governments become to loose their basic functional reason of existance againts citizens.
- Also national borders become to be meaningless in terms of energy sharing. The energy grid system will make sharing energy beyond border dwellings meaningfull.

2. Distributed Capitalism

Energy regimes shape the nature of civilizations; how they are organized, how political power is applied and how social relations are conducted. In the 21 Century, the location of control over energy production and distribution is going to shift from giant fossil fuel based centralized energy companies to millions of small producers who will generate their own energy in their dwellings and trade surplus. The democratization of energy has profound implications for how we orchestrate and define human life on earth. According to Jeremy Rifkin, we may call this era (TIR) as distributed capitalism. (Rifkin, 2011)

To understand how the 3 industrial revolution infrastructure is likely to change the economic, political and social power dramatically, we should glance how the fossil based first and second industrial revolutions reordered the world. Fossil fuels are elite energy resources. They are found in only select places. They require a significant military investment for secure their access and they also require centralized top-down command – control systems and massive capital to treat them. (Rifkin, 2011)

Three of the four largest companies in the world today are oil companies; Royal Dutch Shell, Exxon Mobil and British Petroleum. The centralized energy infrastructure sets the conditions encourages similar business models. The business models of the second industrial revolution were giant ones. Now underneath these giant energy companies, five hundered global companies representing every sector are in-seperably connected to fossil fuels. The existance of these 500 enterprises are belongs to the existance of 3 energy company. (Rifkin, 2011)

This pyramidal structure realizes an income transfer from bottom to top. And this transfer encourages the income inequality. In contrast, the emerging TIR is organized around distributed renewable energies that are found everywhere. The distributed nature of renewable energies necessitated collaborative rather than hierarchic control mechanisms.

3. 3D Printing

The other pillar of new economy is 3D Printing as a new production paradigm. In the new era everyone can potentially be their own manufacturer in their dwellings as well as their own power company; Production in the home or distributed manufacturing.

The classical (subtractive) manufacturing paradigm shapes the materials with outside forces like cutting, molten, bending, punching and assembly. In a very close future we will begin to manufacture with nano dusts additively. We will be able to provoke nano materials for being a part of the bisset good. These days 3D printing technique is the fore steps of this paradigm. 3D printers build successive layers of the product using, powder, molten plastic or metals to create the good. These machines can produce multiple copies just like a photocopy machine.

3D printing requires 10 percent of the raw material expended in traditional manufacturing and uses less energy than conventional factory production. This reality will be the major support for green energy era. Because when we look at with classical energy consuming paradigm we see that, green energy can't be support high industrial energy consume. New energy era is coming with its new usage paradigms.

In the same way that internet radically reduced entry cost in generating and disseminating information, additive manufacturing has the same potential for reducing the cost of producing hard goods, trading these goods (only knowhow of the goods will be imported not the body of them), making entry costs low to encourage SME's to challenge with giant companies.

Thus we can foresee that carrying complete goods will lose its weighty part in logistic sector through 2050's. These years logistic sector become the carrying of goods which requires economy of scale and nano molecules which 3D printing machines use.

In other words factories will be evolved into factories which produce nano-molecules and 3D printing machines for distributed manufacturing. As a result, the number of classical factories and the energy usage of manufacturing activities will decline.

4. Dwelling

In 1950 there were 80 cities on earth which every one of them includes more than 1 million people. In 2015 the number of these cities will be about 550. According to Jacques Attali urban enlargement is a fact. In 2025 there will be more than 30 cities on earth which includes more than 10 million people. According to Attali, the economic, political and cultural turbulences of future will originate not from workers or officials conversely from suburbs of great cities. (Attali, 2007)

However, we think that urbanisation will disconfirm itself at some point and a converse progress will start before 2050's. How this will be happen? The green energy, genetic technology and robotic manufacturing will transform the meaning of being unemployed.

The first and second industrial revolutions first gather people from their villages to the cities and organize them for working in factories than this era gradually loads the production to machines and human being evolved into an operator and then to a knowledge or service personnel. This progress will turn back as geographically and functionally. As we mention, the death of factories (robots will do almost everything) and 3D manufacturing will dramatically decline the need of human personnel in industry,

except programmers and designers. Roughly there will be two kind of worker; white collar workers and a surplus crowd of people. For programmers working at home or working far from office will be very possible due to the sophisticated communication systems. What will happen to surplus crowd of people?

They will be the new age farmers and villager of the 21 and 22 Century. While big cities are getting bigger some other people will began to immigrate to cheap houses of rural areas. They will produce their own energy with cheap green resources, they will manufacture enough good with their 3D printing machines and they will make agricultural activities in their green houses with genetically altered seeds.

Thus, ironically, the industrial developments which gather people together in cities will disconfirm itself and distribute people to rural areas as they lived pre-industrial age. People are social animals. They will prefer to live together in towns but the needs of life will not require huge amounts of people together in one settlement.

4.1 Usage of Residence

The rising income inequality changes the behaviour of prosperous communities. They began to live in enclosed locations with borders in especially big cities. These areas could fulfill almost every need of residents by mega markets, work centres and recreation areas and they began to settle down the periphery of cities as big technologic villages. The transportation between these residents and the city is provided by highways. The future cities will began to be connected residence dots which are being protected from suburbans. Thus outer areas of the city will get less attention and will get less participation from taxes of the city. The hiper-empires (transnational companies) will be strongly related with these types of knowledge production centres and the others will be the others who deny being a part of highly controlled society by transnational insurance companies. We will not explain much the hiper-empires, and the possible role of transnational insurance companies on crowd of people.

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