

Green Technology In The Context Of The Knowledge Economy And Its Role In The Sustainable Development Process

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Environmental issue considered the most contemporary issue in the recent period, where the climate changes taking place on the Earth call for strict and quick action by all countries in the world. So the makers of development policies in most countries of the developed world became takes into account the environmental aspect when they put development policies, and the Sustainable development has also become the main objective of the economies of those countries. This means that the economic and social strategies are no longer concerned with issues such as growth and productivity and income level only, but are also becoming concerned with the environmental impacts of economic activities in the community and work to achieve environmental sustainability of the economy.

The attention to the environmental problem coincided with the rise of a new type of economy, based on the using, distributing and producing knowledge by using information and communication technology. This new style of economy-called **knowledge economy**.

It can be said that the emergence of the knowledge economy was in the sixties of the twentieth century by the world economic **Fritz Machlup**¹ who noted an increasing proportion of knowledge in the American national budget as he worked on the social benefits of knowledge measurement in addition to the strong correlation between knowledge and information and communications technology. The emergence of the knowledge economy accompanied with the information revolution and the dramatic increase in the innovations growth rate.

We can define the knowledge economy as *“an advanced stage of development of the post-industrial economy, which is synonymous to the concept of the innovative economy. As the main factor in the construction of development is knowledge and*

¹ F. Machlup (1962), the Production and Distribution of Knowledge in the United States, Princeton: Princeton University Press.

human capital"¹. While green knowledge economy is **"greening of the existing economy through product and process innovations that are used to tackle climate change, reduce greenhouse gas emissions, improve resource efficiency and conserve ecosystems and biodiversity"**².

There was a belief that these high levels of growth in the level of technology will support the economies of the developed countries, this technology has achieved high levels of economic growth, and has also led to a rise in productivity. But with the emergence of the environmental problem and climate change on Earth, emerged a more serious question, it is related to the achievement of this new technology for environmental sustainability in the knowledge societies. Therefore, a new issue has emerged in response to this challenge is in how to answer the following question:

How can we make this technology is environmentally friendly or Green Technology? Hence appeared the so-called "**Green Technology**". Which is considered a key factor in reaching the green economy, which the United Nations defines it as *"process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using less natural resources, creating less waste and reducing social disparities"*³.

Achieving to a green economy is part of the goal of sustainable development, and therefore we need to environmental innovations, (**Eco-innovation**). Which means *"Innovations which are able to attract green rents on the market – they create value to users while progressively reducing net environmental impacts"*⁴.

These green innovations are the embodiment of green technology that reflects the *"technology that can create products, which can be fully reclaimed or reused"*⁵.

Green technology designed to achieve the following objectives⁶ :

- **Sustainability** - meeting the needs of society in ways that can continue indefinitely into the future without damaging or depleting natural resources. In short, meeting

¹ IISD (2010). The Digital Economy and the Green Economy: Opportunities for strategic synergies, International Institute for Sustainable Development. Retrieved October, 2010

² The Green Knowledge Economy <http://www.geoeconomics.com>

³ UNEP. (2010). Green Economy Report: A Preview, United Nations Environment Program.

⁴ Challenges and opportunities for ICT OECD workshop ICTs and Environmental Challenges Copenhagen 22-23 May 2008 Maj Munch Andersen

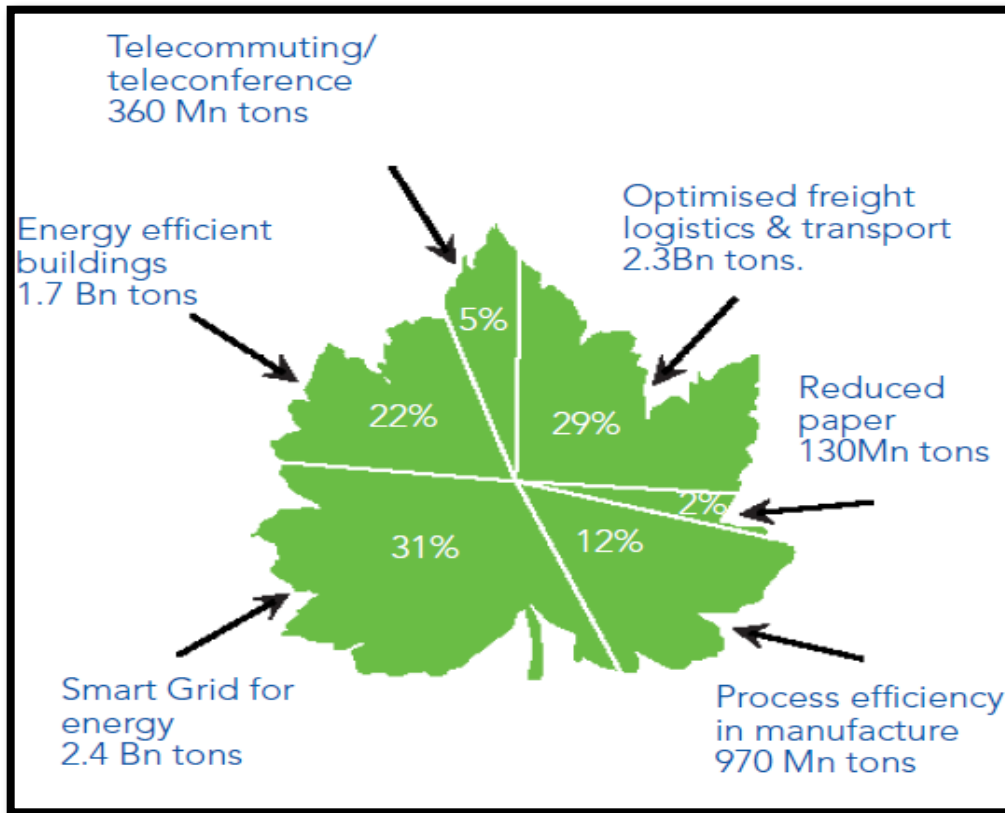
⁵ A Feasibility Study on the Application of GREEN TECHNOLOGY FOR SUSTAINABLE AGRICULTURE DEVELOPMENT: Assessing the policy impact in selected member countries of ESCAP-APCAEM, P18.

⁶ <http://www.green-technology.org/what.htm>

present needs without compromising the ability of future generations to meet their own needs.

- **Source reduction** - reducing waste and pollution by changing patterns of production and consumption.
- **Innovation** - developing alternatives to technologies - whether fossil fuel or chemical intensive agriculture - that have been demonstrated to damage health and the environment.
- **Viability** - creating a center of economic activity around technologies and products that benefit the environment, Speeding their implementation and creating new careers that truly protect the planet.

In Europe has been the adoption of the agenda under the title (**Europe 2020**) Includes development strategies gives EU countries the possibility to achieve environmental sustainability and sustainable development. Agenda shows that application green technology can contribute to reduce energy consumption in industrial processes and



the distribution of emissions from vehicles, monitor and control building...and others as in the following figure¹.

In another study conducted by the (Claudia Ghisetti and Francesco Quatraro)², researchers found that areas with green technology are characterized by significantly improved environmental performance, and the introduction of green technology plays an important and positive role on economic performance.

The application of green technology will help the economy to get the following points of strength³:

- **Ability to meet strict product specifications in foreign markets:** Manufacturers in developing countries typically need to meet stricter environmental requirements and specifications to export their products to industrialized countries than vice versa. The adoption of green technologies can help exporting companies to gain advantage and market share over competitors.
- **Reduction of input costs:** Green technology can improve production efficiency through the reduction of input costs, energy costs and operating and maintenance costs, which can improve a company's competitive position.
- **Environmental image:** Adopting green technology can improve a company's environmental reputation, which is crucial if other competitors and consumers are becoming more environmentally conscious.
- **Ability to meet stricter environmental regulations in the future:** Companies that invest in green technology are more likely to be better equipped and ready for stricter environmental regulations as well as product specifications that are expected to be imposed on them in the future.

From the above, we find that the environmental situation needs to be improved, by using green technology in the context of the process of transition towards a knowledge economy.

Therefore, there is a group of the required initial actions undertaken in order to build a Green knowledge economy:

¹ A Green Knowledge Society an ICT policy agenda to 2015 for Europe's future knowledge society a study for the Ministry of Enterprise, Energy and Communications, Government Offices of Sweden by SCF Associates Ltd Final Report 2009, P27.

² Claudia Ghisetti and Francesco Quatraro, Is green knowledge improving environmental productivity? Sectoral Evidence from Italian Regions The SEEDS Work paper 2014

³ R. Luken and F. Van Rompaey, "Drivers for any barriers to environmentally sound technology adoption by manufacturing plants in nine developing

- Shared, sustainable procurement (e.g. broadband and local resource-based sectors)¹.
- Housing retrofit (linked to sustainable construction).
- Innovation Centre for the Green Economy.
- Investing in natural capital.
- Creating green jobs.
- increasing the enabling effects of ICTs on the development of the green economy through improvements in the efficiency of production, distribution and consumption of goods and services throughout the economy and society; by reducing demand for energy and materials through the whole or partial substitution of virtual products and services for their physical equivalents; and through the dematerialization of human activities and interactions. Thus the largest influence of ICT is likely to be in enabling energy efficiencies in other sectors².

Conclusion:

In the end we can say that green technology in the context of the knowledge economy activities is crucial in achieving sustainable development in modern societies. It also effectively contributes to achieving environmental sustainability. This is reflected not only in the geographical area of the country concerned, but all over the world. Consequently green knowledge economy can be considered an important opportunity for the Arab economies in order to improve the results of development process and meet global environmental standards.

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