LCE> Vol.2 No.2, June 2011

OPEN ACCESS

Socio-Economic Development and Primary Energy Sources Substitution Towards Decarbonization

PDF (Size:321KB) PP. 49-53 DOI: 10.4236/lce.2011.22008

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ABSTRACT

Scanning the last 250 years, we can observe five great technological transformations that happened in the socio-eco-nomic development. On the other hand, there is a relationship between the socio-economic development and the substi-tution process of primary energy sources. Since the industrial revolution, there has been a smooth but growing substitu-tion among primary energy sources. First the switch from wood to coal, then this last one by oil and natural gas. These are non-solid fossils, which leads to a decrease of the carbonic intensity. These substitutions implied some important technological transformations. Bearing in mind a sustainable development of energy systems and using technological forecasting tolls, this study points out to the leadership of the alternative energies among the primary energy sources until 2050 - 2070. In this sense, even with the predictable overall increase of energy consumption, this study also shows that through the substitution dynamic it is possible not only to reduce the carbonic intensity, but also to reduce the car-bonic emission in absolute terms from 2040 - 2060 on.

KEYWORDS

Primary Energy Source Substitution, Technological Transformation, Socio-Economic Development, Sustainable Development, Carbonic Intensity, Decarbonization

Cite this paper

J. Matias and T. Devezas, "Socio-Economic Development and Primary Energy Sources Substitution Towards Decarbonization," *Low Carbon Economy*, Vol. 2 No. 2, 2011, pp. 49-53. doi: 10.4236/lce.2011.22008.

References

[1] R. U. Ayres, "Technological Transformations and Long Waves – Part I," Technological Forecasting and Social Change, Vol. 37, No. 1, 1990, pp. 1-37. doi:10.1016/0040-1625(90)90057-3

[2] R. U. Ayres, "Technological Transformations and Long Waves – Part II," Technological Forecasting and Social Change, Vol. 37, No. 1, 1990, pp. 111-137. doi:10.1016/0040-1625(90)90065-4

[3] J. C. O. Matias, "Scenarios Building for the Primary Energy sources," Ph.D. dissertation, University of Beira Interior, Covilh?, 2003.

[4] Intergovernmental Panel on Climate Change (IPCC), "Greenhouse Gas Inventory: Reporting Instructions," Vol. 1, IPCC/OCDE/IEA, London, 1997.

[5] Intergovernmental Panel on Climate Change (IPCC), "Greenhouse Gas Inventory: Workbook," Vol. 2, IPCC/ OCDE/IEA, London, 1997.

[6] Intergovernmental Panel on Climate Change (IPCC), "Greenhouse Gas Inventory: References Manual," Vol. 3, IPCC/OCDE/IEA, London, 1997.

[7] L. Schrattenholzer, "Energy Demand and Supply, 1900-2100," International Institute for Applied Systems Analysis, Laxenburg, 1998.

[8] G. P. Hammond, "Energy, Environment and sustainable development: A UK perspective," Trans IChmE, Vol. 78, Part B, July 2000, pp. 304-323.

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