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Water, energy and environmental challenges in the XXI century: solutions for the future

António Costa Silva[a,1]

[a]Partex, SA, Rua Ivone Silva, Nº 6, Lisboa, 1050-124, Portugal

Abstract

This presentation focus on the challenges for the XXI century and solutions for the future regarding water, energy and environment. The characterization of the current world situation in terms of geopolitics, economy, global threats and resources, including not only minerals and energy but also water and food, is addressed. Structural and environmental challenges that are reshaping the commodities and energy markets are discussed. The situation of water resources is addressed with the growing number of the countries with scarce access to resources and the need to find sustainable solutions for the future. Finally a vision of the main issues for the future is presented addressing emerging trends that are under development, specially in the energy markets.

*Keywords:*Energy; Water; environmental challenges; XXI century

1. Introduction

The world is at a crossroads where we have the intersection of issues related to Geopolitics and Economy (with the globalization effects, the decline of the Nation State, the emergency of new actors in the international scene, the partial transference of financial power across regions of the globe), issues related with the Global Threats (ranging from the climatic threat to migrations, terrorism, piracy, emergency of failed states, the collapse of order in same areas of the globe) and issues related with the control of resources (not only minerals or energy but also food and water). Fig. 1 below summarizes the key issues that are at stake.

* Corresponding author. Tel.: +351 21 791 29 41
  E-mail address: acsilva@partex-oilgas.com

Fig. 1. Summary of the key issues that are at stake.

2. Global Dependency on Resources

The global dependency on resources will tend to increase 3 times more by 2050 and we are moving from a planet with 7 billion people, 65 trillion US$ of GDP and a global car fleet of 800 million cars to a planet that, in the next 20 to 25 years, may reach 8.5 billion people, a significant increase of the world GDP and a car fleet that can grow between 2 to 3 times. Fig. 2 below illustrates these global challenges

Fig. 2. World global challenges.

Solutions regarding the need of a new mind set for the production, use and consumption of resources are discussed namely the concept of Circular Economy. This involves a paradigm shift with a new understanding of the cycles of production, manufacturing, design, collection of products, and raw materials recycling.

Fig. 3 below summarizes the concept of Circular Economy and the need of a paradigm shift to enable a more sustainable access, production, distribution, utilization and recycling of resources.

Fig. 3. the concept of Circular Economy.

The application of the concept of Circular Economy in the European Union is specially pertinent in terms of demonstrating its practical consequences. The European Union every year produces 3 billion tonnes of waste, about 6 tonnes per inhabitant. This is a huge amount of waste produced. We live in fact in a throw-away society that transforms resources into garbage with a speed without parallel in history. Looking to resource efficiency along the value chain, implementing the concept of Circular Economy, may allow the EU to reduce raw materials needs by 24% in 15 years. This better use of resources in the EU may represent savings of 630 billion Euros