

petitive edge over uranium. Although further analysis must be done, feasibility of this project and reprocessing this energy is still open. Conferences with experts from as many as 32 countries are held, including one by the European Organization for Nuclear Research (CERN) in 2013, which focuses on thorium as an eco-friendly, nuclear waste free alternative energy technology (see figure 3).

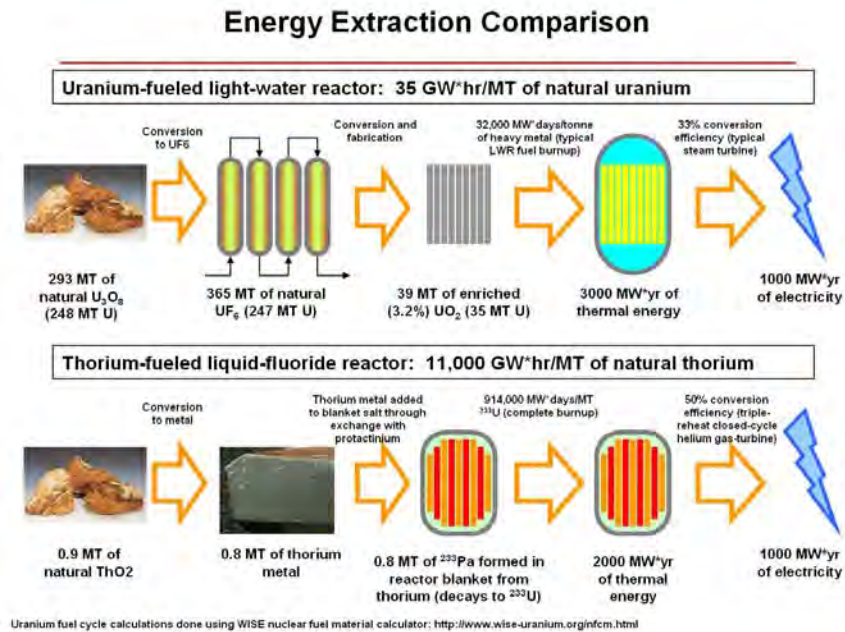


Fig 3 – Energy Extraction Comparison

Recognized expert Hans Blix, former head of the International Atomic Energy Agency, emphasizes that ‘the thorium option offers the world not only a new sustainable supply of fuel for nuclear power but also one that makes better use of the fuel's energy content’.

Summing up all the facts analyzed in the research we define thorium energy as a very promising and advanced energy type. All the advantages pointed out make it an absolutely indispensable energy source of the future.

References

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THE POTENTIAL OF ALTERNATIVE ENERGY SOURCES

Myasnikov V.V., post graduate student

Supervisor – Khomenko S.A., associate professor

Nowadays energy security is attracting much attention among governments and the public. The first factor is the pressure of demand which continues to increase worldwide on the basis of population growth and the spread of prosperity. There are some 200 million new customers for commercial energy each year. The result is an increase of around 1.5% a year in oil demand and an increase of over 2% a year for natural gas. The second factor is that there is a growing requirement for trade because each of the four significant importers (the US, Europe, Japan and China) are all

facing the need for increased imports. India too is expected to become an importer on a growing scale. Trade now supplies something like 50% of daily demand worldwide. By 2015 on the figures produced by the International Agency that could rise to 70%. The third factor is on the supply side. Supplies are concentrated in a small number of areas. By 2015 up to 80% of supply will come from just three areas of the world: West Africa, Russia and overwhelmingly the Middle East and from the five states around the Gulf including Iran and Iraq. The problem is that few of those countries are open to international investment. And the fourth factor is the environment. The science of climate change is not absolute or finalized but the evidence of global warming continues to grow and that evidence appears to have had a real impact on public opinion. Climate change has become an issue of popular public concern not just a topic debated at academic conferences. These are the reasons – immediate and long term why energy security is on the agenda, and why so many people are focused on the question of energy policy [1].

What can people do? The first thing to stress is that energy security cannot be achieved in one country. Energy policy and energy security has to be international and inclusive. The second thing to stress is that there is no shortage of supply and many options for the development of technology in ways which could produce viable alternatives. The first step in the restoration of energy security is considered to be the development of the maximum diversity of supply and of the infrastructure required to bring that supply to market. The third thing to stress is that governments need to encourage consumers to innovate and develop technology to reduce carbon emissions. It's possible to do with the help of alternative energy.

Now people have a simple choice – either to turn to nature or to destroy themselves. Apparently, most people would like the first idea much more and so would look through some ways of providing a sustainable future for next generations. In this connection alternative energy plays a tremendous role in contemporary world. It is highlighted that if we incorporate the merits more in our daily life, the demerits of alternative energy will slowly fade away.

There are several advantages of using renewable energy [2]. The major one is that as it is renewable it is therefore sustainable and so will never run out. Renewable energy facilities generally require less maintenance than traditional generators. Their fuel being derived from natural and available resources reduces the costs of operation. Even more important is that renewable energy produces little or no waste products such as carbon dioxide or other chemical pollutants, so it has minimal impact on the environment. It is estimated that renewable energy projects can also bring economic benefits to many regional areas, as most projects are located away from large urban centers.

But even though alternative forms of energy seem to be the perfect solution – the concept is environmental friendly, endless, and above all, it is free, nevertheless, aside from various advantages, there are disadvantages that should be taken into account [3]. The very first and the most important disadvantage that holds true for most of the alternative energies is that their supply is dependent on nature and thus is not constant. For example, it is obvious that solar energy can be generated only at the areas that receive ample sunlight. Whereas for other areas that obtain below moderate to little sunlight, solar energy would not be of much use. Even for the areas with bright sunlight, solar energy can only be generated at daytime and not at nighttime. The same is the case with wind energy. Generating electricity through wind farms is possible only at the countryside or other such areas where windmills can receive wind supply without any obstruction. Biomass is considered to be a good alternative to fossil fuels. Nevertheless, combustion of biomass produces carbon dioxide and similar greenhouse gases. Another disadvantage of biomass is that it is generally produced from corn, wheat, barley, and similar crops all of which are seasonal. Thus, biomass can only be produced in certain seasons.

It is experimentally proved that alternative energy is especially difficult to put into effect in an infrastructure that is already set up. Most of the forms of alternative energy require a certain type of system. This system is very different from the one that they use currently. Therefore, a major infrastructure overhaul is essential before incorporating alternative energy. Considering the monetary

factors, fossil fuels are less costly to use than alternative energy. Fossil fuels can be stored at any location or transported using the regular means, however, in the case of alternative energy various changes and thus huge investment is required to reap benefits.

So, the following shortcomings should be pointed out:

- energy can be trapped only during daytime and only at places receiving desired amount of sunlight;
- efficiency of solar panels is generally low, around 10-15%. Therefore, for a good power supply, large surface area is required;
- wind energy is a clean fuel. However, it does cause significant amount of noise pollution;
- areas which gather biofuels can sustain soil erosion;
- initial investment is quite high and efficiency is low, around 30%.

As far as Belarus is concerned, the country belongs to the group of countries without their own considerable energy and fuel resources. The energy and fuel resources include: crude oil, natural gas, peat, water resources and biomass. However, Belarus' own power resources satisfy 15-17% of its energy and fuel resources requirement [4]. According to these data, there are practically no other sources of energy in Belarus other than those of renewable character. Therefore, the share of renewable energy amounts to 80% of the country's own energy and fuel resources. At present the Republic of Belarus is in the process of implementing the «Target electricity and heat provision program» for achieving at least 25% of industrial production with the use of local types of fuel and alternative sources of energy by the year 2015 [5]. It is obvious that one of the strategic objectives of economic development of Belarus is the decrease of energy imports. The solution to this problem is possible through the enhancement of alternative energy sources and local fuels. It should be mentioned that much emphasis has been placed on the implementation of the program focused on the use of wood and wood waste.

It's possible to conclude that people's concerns about the greenhouse effect and global warming, air pollution, and energy security have led to increasing interest and the development of renewable energy sources, such as solar, wind, geothermal, wave power and hydrogen. Development and effective use of renewable energy sources has a fundamental importance since in the short term they represent the real potential of local fuel and energy resources that can be efficiently involved in the economy and favor the rise of the energy security of the country. The potential of renewable sources of energy should be taken advantage of to a significant degree as energy is considered to be a vital ingredient for socio-economic and technological development.

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