R-the reactor, B – concrete, D – compulsory air cooling, 6 - a class of voltage, kV, 1500 – rated current, A.

Voltage measuring transformer of the NTMI-6 type:

NT – voltage measuring transformer, M – cooling oil with natural air circulation and oils, I – measuring, 6 – the rated voltage of a winding of VN, kV.

REFERENCES

1. Электроснабжение гидрометаллургического завода. Отчет по производственной практике / О.В. Новгородов – Томск, 2013. – 28 с.
2. Power supply hydrosteel plant "PPGHO" (GMZ). work practice report / O. V. Novgorodov, 2013. – 28 p.
3. Rozhkova L.D., Kozulin V.S. Electrical equipment stations and sub-stations. Textbook for colleges. –4d edition. – Moscow, Academyt, 2007. – 448 p.

PROSPECTS OF RENEWABLE ENERGY SOURCES USE AROUND THE WORLD

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Despite the fact that organic type of fuel (oil, gas, carbon) will hold the leading positions as consumed as primary energy resources (80%) up to 2030, the same period expects a continuous growth of energy production from energy sources.

Renewable energy sources include solar, wind, geothermal, biomass energy, hydropower, etc. As yet, many experts believe, a broad use of alternative energy sources is hindered by high cost of their development. Nevertheless, it is supposed that for the period to 2030, the increase in consumption of renewable may reach double figures. Actually, it will be due to a relatively low datum level and their share in the total consumption will remain by 2030 at the level of 7.5-8% [1]. Owing to continuous appreciation of organic types of fuel, especially oil, and also growing contamination of environment around the world many countries take certain measures to remove institutional barriers hindering the development of renewable energy sources.

The development of alternative energy sources sector is encouraged by financial and statutory regulation, while the major corporations create special subsidiaries and research centers within the frameworks of which corre-

sponding R&D activities are conducted. The most rapid growth in the world is demonstrated by wind energy use, the second place belongs to geothermal stations and solar power.

Wind energy potential in the world is immerse especially the greatest attention is paid to offshore wind in comparison to onshore wind. It is due to the fact that offshore wind has a number of advantages, such as higher wind speeds and less turbulence than on land and fewer environmental constraints. Offshore is particularly suitable to large scale development near the major demand centers represented by the major port cities of the world, avoiding the need for long transmission to get the power to demand centers as is so often the case onshore. Offshore is a relatively new technology with significant opportunities for cost reduction, technical innovations and developments which may change the face of renewable in some parts of the world.

However offshore wind has some disadvantages connected with discontinuous production of energy, and also extremely uneven velocity distribution of wind on the territory. It is necessary to maintain significant reserve capacities to provide energy while a great demand in it or with low wind velocity. Vice versa, when there is lower demand in energy with high wind velocity, additional expenses for energy storage are needed. In this case the creation of a wind-power station complex, which gives energy directly to an integrated electrical power system, may be helpful. In compliance with a given principle a large share of major wind-driven power plants are being constructed.

The fastest growth is demonstrated by wind-driven power plants in Europe. A total of 4.336 MW consisting of 1.503 offshore wind turbines are fully grid connected in 56 wind farms across ten European countries – the UK and Denmark remain the two biggest markets for offshore wind in Europe, followed by Belgium, the Netherlands, Germany, Sweden, Finland and Ireland. Norway and Portugal each have a full-scale floating turbine. Offshore wind is an essential component of Europe, binding target to source 20% of final energy consumption from renewable. Altogether, Europe is expected to have around 40 GW installed capacity by 2020 [2].

Alongside with wind power use the rapid growth in the world is seen at the most stable geothermal energy. The overall world potential of geothermal energy in the Earth's crust at depth to 10 km is estimated at 18 000 trillion tons of coal equivalent which exceeds the world's geological reserves of fossil fuels 1.7 thousand times [3].

When it comes to advantages of geothermal energy, they are numerous. First and foremost, geothermal energy is renewable, meaning that as long as we do not pump too much cold water into the earth – cooling off the hot

rocks – the energy will just keep on coming! The power stations for geothermal energy don't take up a whole bunch of room, and because of this, they tend to have less of an impact on the surrounding environment. Because geothermal energy is energy in and of itself, no outside sources of fuel are needed to keep the power houses running.

As numerous as the benefits of geothermal efficiency are, there are still some drawbacks, the biggest of them is that a special location that offers the right kind of hot rocks is needed for setting up a geothermal power station. Just any hot rocks won't do, since some rocks might prove too strong to drill through. These rocks also need to be within a reasonable depth to make drilling down to them a feasible option. Volcanic areas often provide the most geothermal efficiency. There's also another risk to consider – sometimes a geothermal site might run out of steam. When it happens, the dry spell may last for periods that reach into the decades! One more disadvantage concerns the potential danger of geothermal energy. When drilling into the earth hazardous gases and minerals can sweep up from beneath the ground, and finding a way to dispose them safely may prove very difficult and dangerous.

Nowadays there are 233 geothermal power stations conducting their activity around the world with a total capacity of 5.1 thousand MW, 117 more with a capacity of 2 thousand MW are being constructed. The leading position belongs to the USA, where it is concentrated more than 40% of the world's geothermal power stations' capacity. Besides, geothermal resources are largely available in the European Union, Italy, France, Portugal and Austria.

Except for wind-driven power plants and geothermal power stations the works on development of more expensive solar power plants are carried out in the world. Solar energy is an inexhaustible source of energy with the most potential as it will continue to produce solar power as long as sun is there. Solar energy is totally free, available widely, produces no pollution, no emission, no noise and no carbon footprint [4]. Cost however poses a major hindrance which makes it impossible to harness the energy which is available all over the earth. Except few locations like Antarctica and Polar Regions, all over the earth receives consistent and steady sunshine for almost whole year.

The initial cost of purchasing and installing solar panels always become the first disadvantage when the subject of comes up. As new technologies emerge, the cost of solar panels is likely to decrease and the use solar cells will increase. Since not all the light from the sun is absorbed by the solar panels therefore most solar panels have a 40% efficiency rate which means 60% of the sunlight gets wasted and is not harnessed. New technologies however have increased the rate of solar panels efficiency from 40 to 80%

and on the downside have increased the cost of solar panels as well. Another disadvantage of solar power production is considered to be its discontinuous production, but this problem may be solved by means of direct connection of installations to the integrated energy system.

The leading role to harness solar power belongs to Germany. In 2010 Germany was clearly the world leader and has only continued the trend. In 2009 alone, Germany installed 3.8 GW of PV solar energy capacity, and the country has added at least 3.3 GW of new solar capacity per year, and more like 6 GW per year between 2010 and 2012. Despite a slowdown in 2013, Germany is expected to remain the top solar market in Europe for the coming years, and still boasts a quarter of the world's installed PV capacity of 26 % [5]. Among the leaders of solar power users are China, Italy, Japan, The USA, Spain, France, Australia, Belgium, and the United Kingdom.

To make a conclusion, it should be emphasized that renewable energy sources are in line with an overall strategy of sustainable development. They help reduce dependence on energy imports, or do not create a dependence on energy imports in countries that will have increased energy needs in the future, thereby ensuring a sustainable security of supply. Furthermore, renewable energy sources can help improve the competitiveness of industries and have a positive impact on regional development and employment. Renewable energy technologies are suitable for off-grid services, serving those in remote areas of the world without having to build or extend expensive and complicated grid infrastructure.

In the long term, renewable energies will dominate the world's energy supply system. The reason is at the same time very simple and imperative: there is no alternative. Mankind cannot indefinitely continue to base its activities on the consumption of finite energy sources.

1. REFERENCES

2. Disadvantages of Solar Energy. – [Электронный ресурс]. – Режим доступа: http://conserve-energy-future.com/Disadvantages_SolarEnergy.php (дата обращения: 09.11.2014).
3. Global Offshore: Current Status and Future Prospects. – [Электронный ресурс]. – Режим доступа: http://gwec.net/global-offshore-current-status-future-prospects/ (дата обращения: 07.11.2014).
4. Information Export Support. – [Электронный ресурс]. – Режим доступа: http://export.by/en/?act=s_docs&mode=view&id=2697&doc= (дата обращения: 07.11.2014).

5. Top 10 Countries Using Solar Power. – [Электронный ресурс]. – Режим доступа: http://pureenergies.com/us/blog/top-10-countries-using-solar-power/ (дата обращения: 10.11.2014).
6. What Are the Advantages and Disadvantages of Geothermal Energy? – [Электронный ресурс]. – Режим доступа: http://dougrye.com/advantages-disadvantages-geothermal-energy.html (дата обращения: 09.11.2014).

LANGUAGE EXTINCTION – EVIDENCE FROM THE BURYAT LANGUAGE

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The first associations which come to our mind when we hear the terms “endangered” or “disappearing” is in connection with the rare species of animals. However, not only animals but also languages are at the brink of extinction. Statistics on the linguistic diversity is striking and fearful. Today, the population of the Earth speaks on about 7 thousand languages. However, by 2100 more than a half of them might die as every two weeks a language disappears. This process is even faster than the reduction of biodiversity [2].

Language is the heart of a culture since it is the carrier and storage of the knowledge and experiences accumulated by a nation throughout history. It embodies the spectrum of human vision, and its varieties provide unparalleled insights into the diversity of human experience and perception. Moreover, it holds people together and establishes their identity as group. Every time a language dies, we lose part of the picture of what our brains can do.

According to Unesco's Atlas of the World's Languages in Danger of Disappearing, a language is considered endangered when it is no longer spoken by children, moribund when only a handful of elderly speakers are left, and extinct when it is no longer spoken.

There are various reasons for language endangerment. The major ones are:

– Globalisation and the spread of industrialization. The global economy often forces small, unindustrialized communities to choose between their traditional language and participation in the larger world.

– Economic problems. As the economy develops and more people leave their hometown in search of a better life, the distance is widening between the ethnic minority people and their mother tongues.