

In this Issue:

- Editorial
- Future Energies Resources
- Emerging Energy Technologies
- Effects & Impacts of Natural Resources Wealth on Iran's Development
- A Futurist
- Book Review
- Monitoring
- Web Surfing
- Virtual World
- World Future 2010
- English Abstract

Future Energies Resources

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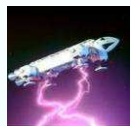
Editorial

Energy and consuming energy resources is one of the most important challenges in the future world.



Future Energies Resources

Renewable energy is still just a small part of the of our overall energy use.



Emerging Energy Technologies

New energies are shaping new technologies so that they can be regarded even as new driving forces of change.



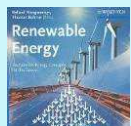
Effects & Impacts of Natural Resources Wealth on Iran's Development

Mr. Mardukhi shares some perspectives on oil and revenues gained from exporting this source of energy



A Futurist

Life and works of Mahdi Elmandjra are introduced to our Iranian readers.



Book Review

Renewable Energy written by Ronald Wengenmayr is the book that is reviewed in this issue.



Web Surfing

Some of useful futures studies websites are introduced here.



Virtual World Foresight for the European Research Area website URL is mentioned.



World Future 2010

This important event is introduced to our Iranian readers.

Editorial

Energy and consuming energy resources is one of the most important challenges in the future world. In recent years a growing attention has devoted to a group of energies and natural resources that can renew themselves and are called renewables. Some countries are tending to plan for using such energies. Regardless of hidden and apparent costs of using these kinds of energies, the characteristic of renewability is the most considerable factor in making them as attractive resources of energy. So many groups of scientists, managers, planners and decision makers are encouraged to study and use them.

In our contemporary world, having fossil fuels can be regarded just as a comparative advantage, not a competitive one. Competition is now in the field of identifying renewable energies that require related science and technologies in order to be exploited. Those countries that have such science and technologies are leaders in this area and will be entitled to the competitive benefits of renewable energies.

The fact is that evolution and progress of human civilization have direct and meaningful relationship with consuming the energies. Evolutional trend of civilization is accompanied naturally with growing trend of energy consumption. But what is understood from consuming the energies today (against what was thought in the past) is not just using fossil energies and polluting the environment intentionally or unintentionally. It means benefiting from new kinds of energies that do not harm the environment so much and in turn they cause saving fossil energies. A few weeks ago, a deputy of the Iranian Minister of Commerce in an interview with Hamshahri newspaper said that continuing current trend of consuming energies in Iran will lead us to import oil and gas as domestic production can not be sufficient for country's needs in 2025. Iran is one of the biggest owners of oil and gas resources in the world and is also regarded as one of the most important exporters of fossil energies. In spite of these facts, it is not so much amazing that the country will have to import such resources of energy in the future as its refinery and processing capacities are not well developed. According to the same source Mr. Zeighami said, "Current situation of energy consumption in Iran is 17, 8, and 2 times bigger than Japan, Europe and China respectively. It's equal to the consumption of energy in a country with a population of 750 millions.". Regardless of different discussions around wasting the energies or subsidies that are paid for energy use, an undeniable reality is appeared here: industrial and refinery infrastructures could be developed according to the pace of fossil energies consumption, but new resources of energies need to be thought about now. As mentioned by Amory B. Lovins¹: "A single nuclear reactor, meticulously engineered, carefully tested, and thoughtfully sited a safe 150 million kilometers away – in fact, the sun itself – is quite enough".

Wind, solar, hydro, geo-thermal, nuclear and even tide energies are just kinds of energies that can replace fossil energies. Still undiscovered sources are in the nature that can be useful sources of energy for human and his evolving civilization. Foresight in the field of energies and natural resources does not mean sitting at the table and adoring the benefits of renewable energies, rather it means discovering new resources of energy in the nature that have not been explored or introduced yet. When we found our surrounding environment and nature full of energies that can be used in the way of advancing human higher objectives and serve the universe, then we will have a new different look at the nature. Even if we could not discover new sources of energy, at least we can use effectively wind, hydro and solar resources that we had already had. Iran is a sunny country and this source of energy can be used effectively through rational measures and planning. Foresight in the field of energy means exploring and identifying unknown resources of energy and future societies' needs along with a better consumption of existing and potential resources of energy.

¹ Lovins, Amory B., *Soft energy paths: Toward a durable peace*, Mass. U.S.A., 1977.



Future Energies Resources

Renewable energy is still just a small part of our overall energy use. While it's growing steadily, we're going to need alternatives if we hope to reduce our dependency on oil, and the carbon-dioxide it chugs into the atmosphere when we burn it. Luckily, scientists in labs around the world are finding even more efficient ways to produce energy from what's readily available and not buried beneath megatons of earthly crust.

1. Hydrogen

Like the new TV ads say, the still-unavailable Hydrogen 7 is "ready for the world... when the world is ready." But progress on California's "hydrogen highway" hasn't quite hit the numbers supporters hoped it would. Fuel-cell technology has alternately been a darling of Wall Street and Detroit for almost a decade now, but we've yet to see many hydrogen-powered vehicles in the wild. The technology seems like an environmentalist's wet dream (literally), with hydrogen bonding with oxygen to produce power and water — and no greenhouse-gas emissions to speak of. But building a new series of hydrogen power stations hasn't been as easy as once thought, and people still think "Hindenberg" when they think "hydrogen," although it seems to be a safe enough technology that transit authorities uses hundreds of hydrogen-powered buses to move us around urban centers. Still, hydrogen's ultimate downfall may be battery technologies and other clean fuels that could overtake it before it has the chance to get wide adoption.

2. Biofuels

This is a fractious bunch of youngsters, with fraternal twins biodiesel and corn-based ethanol trying to keep its younger sibling — cellulosic ethanol — from hogging the family photos. Enormous amounts of capital have flowed into developing both biodiesel (Microsoft co-founder Paul Allen is funding the biggest biodiesel refinery in the country in Washington State) and corn-based ethanol (Sun Microsystems founder and venture capital Vinod Khosla has made big bets in this space). Converting vehicles and power plants to these renewable fuels that act and burn like fossil fuels has certainly made much headway. Heck, you could be burning an ethanol blend in your car right now and not even know it, and installing conversion kit for biodiesel makes putting on new spinning rims look tough.

3. Solar

Solar is probably the sexiest of the renewables, what with its black shiny arrays, tilting half-interested at Old Sol. Between tax breaks to install solar panels and new sleeker technology that makes your neighbors want to say "cool roof, man," solar is beginning to take off. Thin-film technology — allowing you to bend the silicon components into more flexible shapes — and increases in solar-cell efficiency mean you can install solar in the Northeast more viably. And momentum is there among legislators as well. In Colorado, the state has passed a "renewable portfolio standard," meaning that not only do utilities need to produce a great deal of renewable energy in the coming decades or face penalties, but they also have to buy a portion of that renewable energy from its customers with solar roofs.

4. Wind

Windmills have come a long way from Kansas farm country and being Don Quixote's nemesis. Wind power first took off — as did many renewable energy sources — in the late '70s and early '80s with the last spike in the price of oil. But after that it stalled until fairly recently. With many states forcing utilities into renewable energy production, this has spurred great technological advances in wind power, and now wind projects are installed or planned in almost every state. The era of having your own windmill, and going "off the grid," is also back, with personal household models costing under \$20,000, assuming you have forgiving neighbors. And efficiencies in technology mean you don't need a hurricane to generate a lot of power. But wind's popularity has also created a bottleneck — estimates are that you'll be waiting longer for a wind turbine (about 18 months) than you will for a black Prius.

5. Batteries

They're not really a fuel, but they're the "universal solvent" to our current rate of use of fossil fuels. Technically, we still burn more dinosaur soup making electricity for buildings than on the road, but all those cars and trucks we sit in use energy in other ways, too. They require gas stations everywhere, and that means yet more trucks to haul three grades of gas and Cinnabons to highway rest stops across the country. But new battery technology will last longer and charge more quickly, making it possible to burn the right fuel in the right place, rather than transporting the wrong fuel all over the place. So maybe as you drive from Seattle to Boston, you'll top up your electric or hybrid car with tidal power in Seattle, wind power in Colorado, cellulosic ethanol in Nebraska, biogasoline in Illinois and biomass to carry you into Boston.

6. Tides

Think about how it feels to have someone chucking a bucket of water in your face, then multiply that by several hundred million, and you get an idea of the energy going untapped around our coastlines every day. Test facilities for harnessing tidal power in Canada's Bay of Fundy have been around since the '70s, and San Francisco will be putting in a high-tech tidal plant at the Golden Gate soon. There are certainly environmental concerns around tidal power, since these projects usually involve some kind of plant at the narrow mouth of a bay or inlet, where the water is moving fastest and most violently, meaning it's not so great for the fish or birds nearby. But the future of ocean power is wave technology, where floating platforms and buoys, dozens of miles offshore, harvest the energy of wave motion. Think of an upside-down yo-yo, except your finger is an anchor at the bottom of the ocean, and the spinning spool floats on the surface. As each wave passes, the yo-yo gets pulled up, and pulls your finger... or a turbine. ...¹

¹ http://dvice.com/archives/2007/11/green_week_top_8_fuels_of_the.php
<http://www.technologyreview.com/Nanotech/18496/>