



# **United Nations Economic Commission for Europe**

**Project “Development of the Renewable Energy Sector in the Russian Federation and in CIS Countries: Prospects for Interregional Cooperation”**

## **Investment Policy Reforms of Renewable Energy in Ukraine**

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29 September 2010

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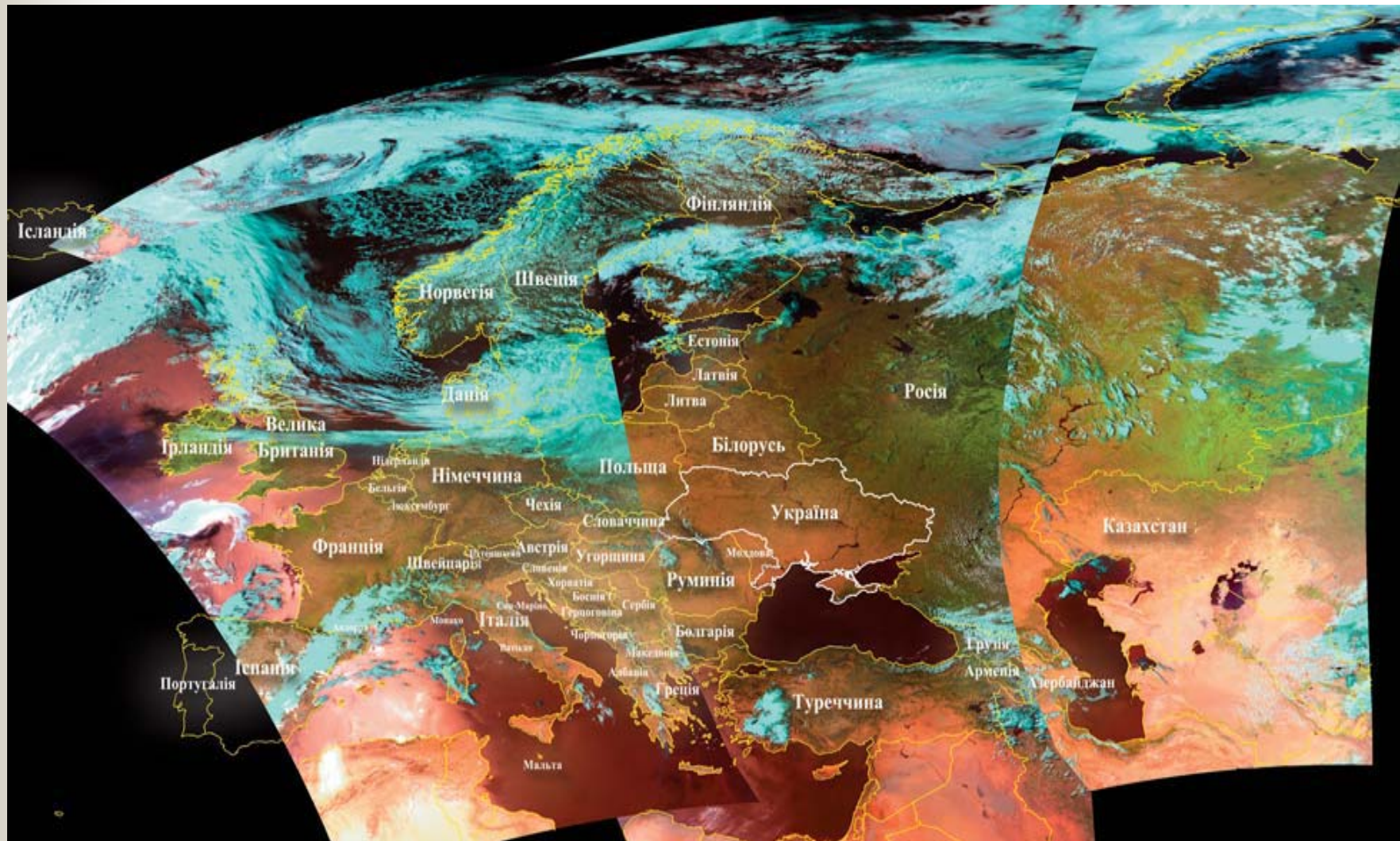


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# Europe from the Cosmos





# Ukraine





## **2. RENEWABLE ENERGY POTENTIAL IN UKRAINE**

- Ukraine belongs to countries, which do not have enough energy resources. And Ukraine gets 100% of imported oil and gas from Russian Federation. Such dependence has negative influence on the country economy.
- The main Ukrainian alternative energy resources:
  - wind energy;
  - solar energy;
  - geothermal energy;
  - small hydro power stations;
  - untraditional fuel;
  - environment energy and waste power potential;
  - small heat power stations.



## 2.1 RENEWABLE ENERGY POTENTIAL IN UKRAINE

- In the Energy Strategy 2030 adopted by Ukrainian Government (decree 145-r of March 15, 2006) it is stated that
- “Development of alternative and renewable energy sources (ARES) should be regarded as an important factor enhancing energy security and decreasing anthropogenic impact of the energy sector on the environment. Large-scale use of ARES potential in Ukraine has not only internal, but also international importance as a essential factor mitigation on climate system, improving general energy security state in Europe.”

## 2.3 Basic scenario of Energy strategy of Ukraine until 2030 for using URSE development, mln tce/year

RSE development directions	URSE development level by years			
	2005	2010	2020	2030
Bioenergy	1,3	2,7	6,3	9,2
Off balance energy sources	13,8	15,0	15,7	16,4
Solar energy	0,003	0,032	0,284	1,1
Small hydro power stations	0,12	0,52	0,85	1,13
Geothermal energy	0,02	0,08	0,19	0,7
Mine methane	0,05	0,96	2,8	5,8
Wind energy	0,018	0,21	0,53	0,7
Environment energyЕнергія довкілля	0,2	0,3	3,9	22,7
Total	15,51	19,83	30,55	57,73





## **2.4 RENEWABLE ENERGY POTENTIAL IN UKRAINE**

- Today share of renewable energy in total energy supply in Ukraine is 3%, in electricity supply – 6,5%, including big hydro power stations.
- Level of total annual technically available potential of main types of renewable energy sources in Ukraine is 87 mln tce or 75,66 billions m<sup>3</sup> of natural gas, and is 43% of annual energy needs of Ukraine.



## 2.5 Renewable energy resources potential in Ukraine

RES	Annual technical potential		Annual volumes of substituting for natural gas
	Bln. kW*hour	Mil. T.c.e.	Bln. m <sup>3</sup>
Wind power energy	41.7	21.0	18.26
Solar energy	28.8	6.0	5.22
Geothermal energy	105.1	12.0	10.43
Hydropower energy	27.7	10.0	8.70
Bio energy	162.8	20.0	17.4
Energy of environment	154.7	18.0	15.65
<b>Total RES</b>	<b>520.8</b>	<b>87.0</b>	<b>75.66</b>

### 2.8.1 Potential of biomass and peat in Ukraine (2007)

Type of biomass	Energy potential, mln tce		
	Theoretical	Technical	Economic reasonable
Corn straw	10,39	5,21	1,34
Rape straw	1,07	0,75	0,75
Waste of corn proceeding for seeds (stem, leafs, heart of corncob)	5,7	3,99	2,79
Waste of sunflowers proceeding (stem, calathium, hull)	4,27	2,86	2,86
Wood biomass	2,13	1,66	1,48
Bio diesel	0,50	0,50	0,25
Bio ethanol	2,33	2,33	0,86
Biogas from dung	3,27	2,45	0,76
Biogas from solid domestic waste fields	0,77	0,46	0,26
Biogas from wastewater	0,21	0,13	0,09
Energy plants	14,58	12,39	12,39
- poplar, silver grass, acacia, alder, pussy willow	1,65	1,15	1,15
- rape (straw)	0,78	0,78	0,78
- rape (bio diesel)	1,59	1,11	1,11
- corn (biogas)			
Peat	0,77	0,46	0,40
<b>TOTAL</b>	<b>50,01</b>	<b>36,23</b>	<b>27,27</b>



### **3. LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE**

- “Of Entrepreneurship”
- “Of One (United) custom rate”
- “Of state regulation of production and turnover of ethyl, brandy, fruit alcohol, alcohol drinks, tobacco goods”
- “Of rates of excise duty and import duty for some goods”
- “Of alternative types of liquid and gas fuel”
- “Of companies profit taxation”
- “Of alternative types of liquid and gas fuel”
- “Of value added tax”
- “Of licensing of certain types of business”
- “Of excise duty rate for ethyl alcohol and alcohol drinks”
- “Of physical person’s income tax”





### 3.1 LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE

- In May 2009 Ukraine Parliament adopted the amendments to the some laws to stimulate the production and utilization of bio-fuel in Ukraine.
- It was determined the aim to reach the share **bio-fuel consumption 20% to 2020 in the total fuel consumption in Ukraine.**
- Hole scale utilization of the renewable energy in Ukraine will permit to cover 43% total demand of energy and will save 76 bln. m<sup>3</sup> natural gas.



## **3.2 LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE**

- Starting from 1 January 2010, during next 10 years, the profits of the bio-fuel producers gotten from the bio-fuel selling is free of taxation, as well as profits of the equipment producers for bio-fuel industry, and profits of the supplier agriculture machines, and energy supplier, which generated by installations, which consume the bio-fuel.
- From 1 January 2010 to 1 January 2019 technique, equipment, which will be used for reconstruction and creation of the bio-fuel production entities and for modernization of the installations and vehicles for bio-fuel consumption, will be released from custom tax in case that they are not produced in Ukraine.



### **3.3 LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE**

- It will be applied privileged depreciation for new fixed assets of the alternative fuels producers (50 % of the balance value for the installations which consume alternative fuels and equipment which produce bio-fuel during first year of its placement).
- The excise tax rate is installed equal zero for the bio-fuel production
- There are estimations that only 5% of agriculture land, used under energetic industrial crops, could cover the demand of agriculture in bio-diesel fuel.





### **3.4 LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE (“Green Tariff”)**

- In March 2009 Ukraine Parliament adopted the amendments to the law “Of electric power engineering”, which fixed the “Green Tariff” for stimulation of utilization of the alternative power sources.
- **For legal entities, which are producing electricity with using alternative power sources, “Green Tariff” is fixed until January 01, 2030.**
- *Coefficient of “Green Tariff” electricity, produced with alternative power sources, fixed on level:*
- - 1,2 – for electricity, produced from wind power, by electric power equipment, which defined capacity is not more than 600 KWt;



### **3.5 LEGAL BASIS FOR RENEWABLE ENERGY DEVELOPMENT IN UKRAINE (“Green Tariff” )**

- - 1,4 – for electricity, produced from wind power, by electric power equipment, which defined capacity is more than 600 KWt but not more than 2 000 KWt;
- - 2,1 – for electricity, produced from wind power, by electric power equipment, which defined capacity is more than 2 000 KWt;
- - 2,3 – for electricity, produced from biomass;
- - 4,8 – for electricity, produced from solar radiation of land power station;



## **4. BARRIERS TO DEVELOPMENT RENEWABLE ENERGY IN UKRAINE**

- The key barrier to rational and sustainable use of energy is that tariff levels which do not correctly reflect costs are too low to incentivise investments in energy savings or sustainable supply options. Affordability of higher tariffs to low-income households is a key issue.
- A well-designed subsidy scheme can cushion vulnerable households against tariff increases, while at the same time energy efficiency itself is a powerful instrument to lower their energy bills, but its development requires the series steps and time.
- The regulatory environment which is conducive to renewable energy investments is not finalized.
- Obstacle for wide use of different types of alternative energy sources is high starting investment amounts with comparison with usual fuel and without estimation of environment influence, mistrust from investors, governments, users.





## **4. 1 BARRIERS TO DEVELOPMENT RENEWABLE ENERGY IN UKRAINE**

- Main limit of geothermal energy engineering development is high starting investments: exploration, drilling, equipment for well, which costs 50% of investments.
- The institutional and procedures framework for development of the renewable energy are in process of installation.
- Interpretation of the renewable energy development as the way to pursue sustainable energy objectives and to improve Ukraine's energy security is not popularized enough in community.
- In Ukraine there no appropriate Government support scientific researchers for alternative energy engineering development.
- One of the problems of efficient using of wind electricity stations is lack of information of wind potential in construction location.
- Important problem now is necessity to create in Ukraine specialized production system for projecting and manufacturing of wind energy equipment.



## **4. 2 BARRIERS TO DEVELOPMENT RENEWABLE ENERGY IN UKRAINE (2)**

- It is necessary to research and correct the map with natural wind energy potential of Ukraine and with development of industrial and small wind energy engineering in Ukraine. There is necessary to prepare scientific research of wind hydro pump equipment for water supply from lower water reservoir to higher.
- Adoption of the Law “Of changes to some laws of Ukraine for support of production and using of bio types of fuel” should develop market of such fuels in Ukraine. But the process of creating implementation methods of this Law is not finished yet.
- Questions, related to different types of bio fuel and their ingredients production, supply chain from production to using, are not solved yet.
- This Law covers issues related to creating new companies for bio fuel production, benefits for equipment import, other benefits. But current financial situation don't facilitate there creation There is no clear information of such business licenses.
- Energy Ministry, which should prepare decrees for implementation of the law, can not control the process on local level without departments in regions.
- Existing petrol stations can not buy and control bio fuel separately.



## 5. CONCLUSIONS

- For successful renewable energy development in Ukraine it is necessary to create appropriate environment which includes:
- further development the primary and secondary legislation for support of renewable energy in Ukraine;
- assess the electricity grid and grid protocols in Ukraine in terms of their suitability for accepting renewable energy generation sources;
- develop of the rules and standards for renewable energy development and operation;
- development new institutional arrangements or organizational changes necessary to establish renewable energy support functions of the authority;
- development of the biomass market.
- creation of basis of certificates and metrology;
- creation of basis for equipment production, implementation, using and service repairs.
- Utilization renewable energy resources ought to be provided in effective way without increasing the pollutions.





## 5.1 CONCLUSIONS

- 1. Utilization renewable energy resources and energy efficiency problem resolving are undivided tasks on the way of creation system of energy consumption by men in the mode no conflict with nature.
- 2. Success of resolving these tasks has direct influence for success of solution of the global climate change problem and the transition on the way of sustainable development.
- 3. Renewable energy utilization, energy efficiency are global problems of mankind and need fruitful international cooperation.
- 4. Success in this business will lead to improvement energy security every country-participant and common policy climate.



■ Thank you for attention

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