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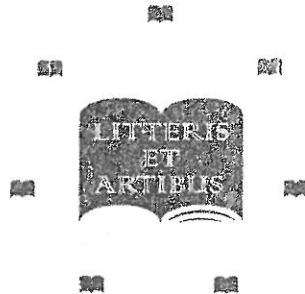
ECONOMICS & MANAGEMENT 2010



2<sup>nd</sup> International Youth Science Festival  
November 25-27, 2010, Lviv, Ukraine



Ministry of Education and Science of Ukraine  
Lviv Polytechnic National University



2<sup>nd</sup> INTERNATIONAL  
YOUTH SCIENCE FESTIVAL

## **ECONOMICS & MANAGEMENT**

Proceedings  
of the I International Conference of Young Scientists  
EM-2010

November 25–27, 2010  
Lviv, Ukraine

Lviv  
Publishing House of Lviv Polytechnic  
2010

Міністерство освіти і науки України  
Національний університет "Львівська політехніка"



2<sup>ни</sup> МІЖНАРОДНИЙ МОЛОДІЖНИЙ  
ФЕСТИВАЛЬ НАУКИ

## ЕКОНОМІКА І МЕНЕДЖМЕНТ

Матеріали  
I Міжнародної конференції молодих вчених  
ЕМ-2010

25–27 листопада, 2010  
Україна, Львів

Львів  
Видавництво Львівської політехніки  
2010

ББК 32.973  
УДК 338.658  
К 637

**Організатори конференції:**

Національний університет “Львівська політехніка”  
Колегія та профком студентів і аспірантів  
Рада молодих вчених

ВМГО “Національний студентський союз”  
Осередок Ради студентів-політехніків Європи в м. Львів  
Осередок Європейського студентського форуму в м. Івано-Франківськ

**Organized by:**

Lviv Polytechnic National University  
Students' and Post-graduates' Self-government  
Young Scientists' Council

All-Ukrainian Youth Public Organization “National Students Union”  
Local BEST Group Lviv (Board of European Students of Technology)  
AEGEE-Ivano-Frankivs'k (European Students Forum)

К 637 Економіка і менеджмент: Матеріали I Міжнародної конференції молодих вчених EM-2010. – Львів: Видавництво Львівської політехніки, 2010. – 268 с.

ISBN 978-617-607-000-9

У збірнику опубліковано матеріали конференції, присвяченої проблемам у галузі економіки, менеджменту, маркетингу, обліку та аналізу, фінансів. Видання призначено для науковців, аспірантів, студентів.

ББК 32.973  
УДК 338.658

*Відповідальний за випуск – О.Л. Березко  
Матеріали подано у авторській редакції*

ISBN 978-617-607-000-9

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# Економічні та управлінські аспекти сприяння використанню віднов- лювальних енергоносіїв для виробництва електроенергії: приклад Латвії

Арта Деніна<sup>1</sup>, Яніс Званітайс<sup>2</sup>

Факультет організації виробництва та підприємництва,  
Технічний університет Риги, Латвія, Рига

<sup>1</sup>E-mail: arta.denina@gmail.com,

<sup>2</sup>E-mail: janis.zvanitajs@rtu.lv

Значення відновлювальних джерел енергії таких як гідро-, вітрової, біомасової, біогазової, та сонячної енергії збільшується завдяки їх позитивному впливу на розвиток економіки, підвищенню безпеки енергопостачання, технологічним нововведенням, становищу довкілля.

Політики та законодавці відіграють важливу роль у формуванні структури, що стимулює подальший розвиток відновлювальних джерел енергії.

Ця стаття аналізує вплив латвійської структури підтримки розвитку відновлювальних джерел енергії на виробництво електроенергії в країні.

Особлива увага приділяється основним управлінським та економічним аспектам сприяння розвитку відновлювальної електроенергії в Латвії. Для сприяння розвитку електроенергії, виробленої з відновлювальних енергоджерел, законодавством впроваджується обов'язковий механізм купівлі електроенергії. Державне акціонерне товариство "Latvenergo AS" є відповідальним за реалізацію цього механізму.

Механізм полягає у тому, що виробники електроенергії, які використовують відновлювальні джерела, мають право продавати її акціонерному товариству "Latvenergo AS", не перевищуючи певної квоти. В рамках цього механізму рівні цін на електроенергію, вироблену з використанням відновлювальних джерел, є диференційованими залежно від типу джерела енергії та потужності електростанції.

З 1995-го року рівні цін змінювалися неодноразово. У статті наведено порівняння рівнів цін відповідно до найновіших законодавчих актів. У статті також аналізується зростання кількостей установок для виробництва електроенергії, що використовують відновлювальні джерела енергії. Автори приходять до висновку, що розвиток спостерігається лише серед гідро- та вітрових електростанцій. Причиною цього є сприятливий рівень цін та розмір квоти (у випадку гідроелектростанцій).

# Economic and Governance Aspects of Promotion of Use of Renewable Energy Sources for Electricity Production: Case of Latvia

Arta Denina<sup>1</sup>, Janis Zvanitajs<sup>2</sup>

Faculty of organization of production and entrepreneurship,  
Riga Technical university, Latvia, Riga, Meza str. 1-7,

<sup>1</sup>E-mail: arta.denina@gmail.com,

<sup>2</sup>E-mail: janis.zvanitajs@rtu.lv

**Abstract** – The paper analyses impact of governance and economic aspects related to support of electricity production from renewable energy sources (RES) on the development of renewable electricity sector in Latvia. The paper explains the principles of the obligatory purchase mechanism in place in Latvia since 1995 to support renewable electricity projects. The paper concludes that only hydro and wind sector have showed growth thanks to generous price levels, and quota as set by the legislation in case of hydro.

**Keywords** – electricity from renewable energy sources, support mechanism, promotion of renewable energy sources, production cost

## I. Introduction

There has been increased interest in the global development of renewable energy projects thanks to their positive impacts on economic growth (avoidance of macroeconomic consequences (oil – GDP effect)), regional development, energy supply security, technological innovation and environmental quality. Policy makers and legislators play significant roles in promotion of efficient production of electricity produced from RES (RES-e) by paying particular attention to the economic and governance aspects.

## II. Governance instruments and economic aspects of promotion of RES-e

There are many forms of governance instruments that can be used to promote production of RES-e. Support price for produced unit of RES-e is the crucial issue for investors in RES-e plants as the cost of investment and production from RES are higher than that from the fossil fuels (Fig.1).

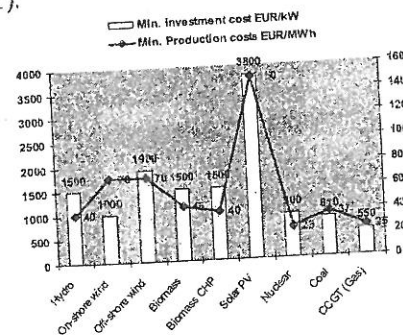


Fig. 1 Minimum investment and electricity production cost of different technologies [1; 6].

### III. Experience of Latvia in promoting RES-e

RES has historically been important for economic development and energy production in Latvia. The average share of RES, mainly biomass, in primary energy consumption occupies roughly one third. Today hydro energy (39,9%) and net imports (32,3%) are the dominant sources in electricity supply in Latvia; wind, biogas and fuel wood all together accounts only for 1,36% of total electricity supply.

Since 1995 the state owned public limited company Latvenergo AS, leader in electricity supply in Latvia, is responsible for implementation of the obligatory purchase mechanism (OPM) as regulated by law. OPM means that Latvenergo AS has to buy produced RES-e for prices set by the legislation. Until 2002 there were no limitation for RES-e to be purchased set. The prices were set fixed on the basis of the average electricity tariff (AET) in Latvia. For small hydro installations, e.g., it meant double AET, for wind – 1,5 times AET. However, from 2002 Latvenergo AS has been obliged to buy only that RES-e that does not exceed annual quota for each RES – 10 MW for small hydro in 2002, 10 MW for biomass in 2002 and 20 MW in 2005; 10 MW for biogas plants in 2002 and 3 MW in 2005; and 1 MW for wind installations in 2003 [3]. Growth in RES-e plants in Latvia is showed in Table 1. Only hydro sector and wind experienced growth thanks to generous tariffs and quota for hydro. Despite the important quota for biomass and biogas no plants were built in this time. The first power plants entered into operation only after 2006.

Since then the quota has been set as a share of total electricity consumption. RES-e producers sell their electricity to Latvenergo AS within the quota for prices calculated in formulas set in the legislation. Since the first comprehensive legislative act on the promotion of RES-e in 2007, until 2009 this legislative framework, mostly price calculating methodologies have changed 3 times. The Ministerial Decree (MD) Nr. 503 (July 24 2007) was in force until February 24 2009 when the MD Nr. 198 was adopted. Amendments to the MD Nr. 198 changing price level within OPM entered into force in May 26 2009. The quota has increased from 49,3% to 54,7% in 2010 and years after. As it can be seen RES-e purchase prices in the framework of OPM have been increased and decreased several times.

### IV. RES-e price under OPM in 2007 – 2009 in Latvia

The Figure 2 shows the change in price levels for RES-e within OPM according to each legislative act. The most generous support level has been under MD Nr. 198. The authors have deliberately chosen the capacity interval of 0,6 – 0,8 MW for small hydro, biomass and biogas installations and 0,25 MW and 1 MW for wind power plants. Wind 10 means – RES-e price produced by wind energy for the first 10 years of operation. 10+10 means purchase price 10 years after the first 10 years of operation. The maximum duration of support is 20 years.

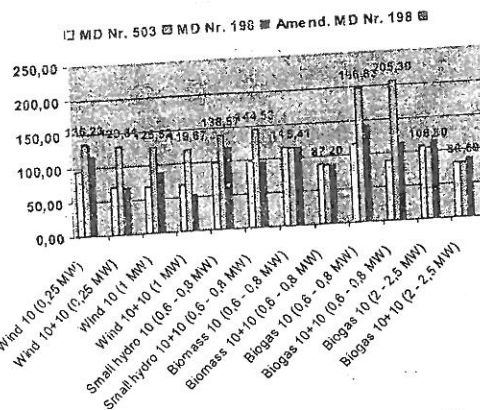


Fig.2 Price levels for RES-e producers, LVL [2; 4; 5].

Growth of RES-e plants operating under OPM is shown in the Table 1.

Table 1

Development of res-e installations [7]

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hhydro	20	34	54	72	100	135	146	146	146	140	139	139	144
Wind	1	2	2	2	2	14	15	15	15	15	15	15	20
Biomass											1	1	3
Biogas										3	3	4	5
Total	21	36	56	74	102	149	161	161	161	159	157	161	172

### Conclusion

In the past only hydro power and wind power plants have showed significant development thanks to generous quota and price levels set by the legislation. The price level set in 2007 has been enough motivating. This is proven by increase in numbers of RES-e plants from 2008 – 2009 as it normally takes 1,5 to 2 years from the investment decision to build the plant. It is probable that if the price level set by MD 198 was still into force RES-e production would increase fast in the coming years, however, such price would increase significantly electricity tariffs for electricity consumers as all RES-e purchased within the OPM is then paid by the electricity consumers.

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