ERASMUS Staff Mobility – Teaching at UPV

Polytechnical University of Valencia, Spain

Observations and Suggestions

Peter Lohmander
Professor, SLU, Sweden

Education and Culture DG

Lifelong Learning Programme

SLU

Swedish University of Agricultural Sciences
SLU, Umea, Sweden, Sessionsalen, 2011-10-06,
11.40 HRS

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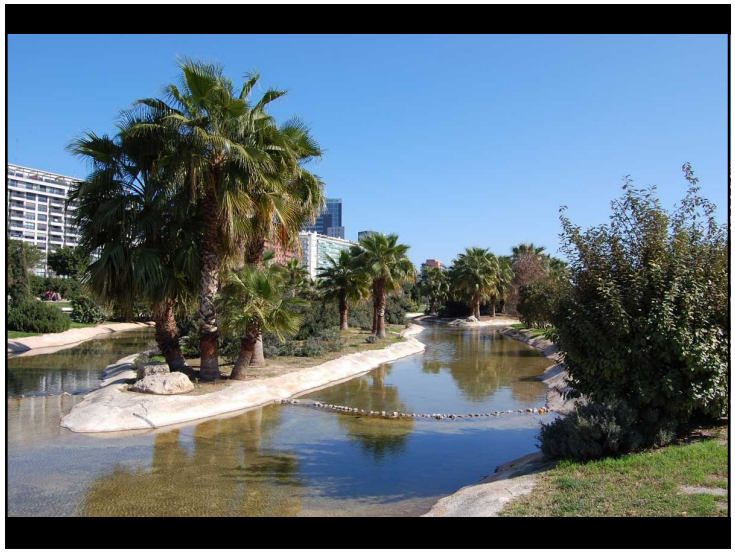

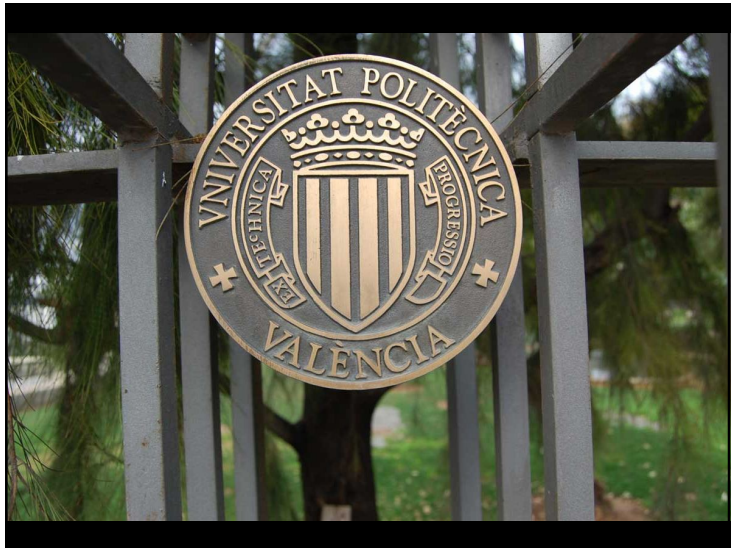
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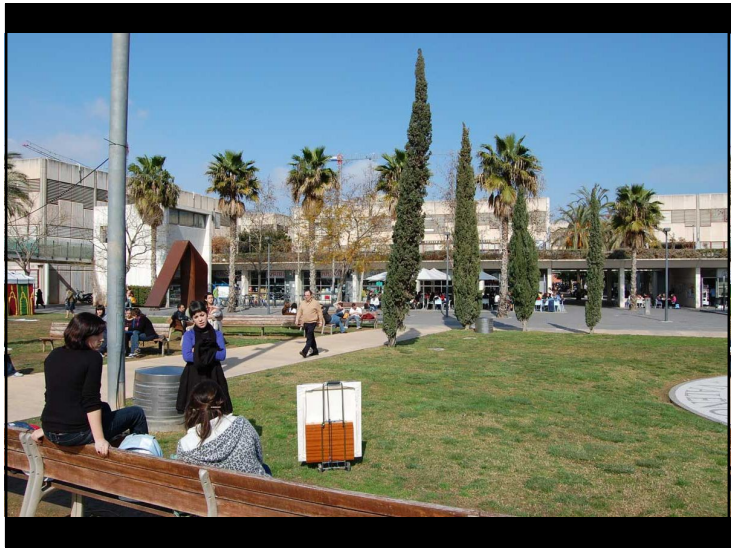

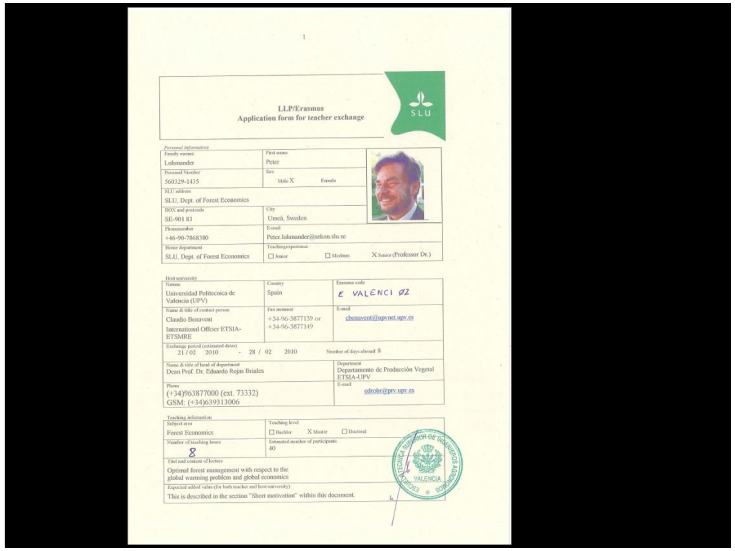

LLP/Erasmus
Application form for teacher exchange

SLU

What are the objectives of staff mobility for teaching?

#1 To encourage higher education institutions to **broaden and enrich the range and content of courses** they offer;

#2 To allow students who do not have the possibility to participate in a mobility scheme, **to benefit from the knowledge and expertise** of academic staff from higher education institutions and from invited staff of enterprises in other European countries;

#3 To promote exchange of expertise and experience on **pedagogical methods**;

#4 To **create links** between higher education institutions and with enterprises;

#5 To motivate **students and staff to become mobile** and to assist them in preparing a mobility period.

- http://ec.europa.eu/education/erasmus/doc1067_en.htm

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#1 To encourage higher education institutions to broaden and enrich the **range and content of courses** they offer

Optimal forest management with respect to the global warming problem and global economics

- Lectures by Peter Lohmander at UPV, Polytechnical University of Valencia,

Spain, February 2010

Summary with references:

http://www.lohmander.com/PL_UPV_2010/UPV10.pdf

http://www.lohmander.com/PL_UPV_2010/UPV10.doc

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Optimal forest management with respect to the global warming problem and global economics

- Lectures by Peter Lohmander at UPV, Polytechnical University of Valencia, Spain, February 2010

- Summary with references
- http://www.lohmander.com/PL_UPV_2010/UPV10.pdf
- http://www.lohmander.com/PL_UPV_2010/UPV10.doc

- CHP, Combined Heat and Power: Illustrations and typical figures from one plant in Sweden
- http://www.lohmander.com/NorrkopingDec08/NorrkopingDec08.htm

- Forest Management and Policy, Bioenergy and CO2: Briefing and graphs
- http://www.lohmander.com/Nancy08/Nancy08.ppt
- http://www.gip-ecofor.org/docs/nancy2008/ppt_des_presentations_orales/lohmander_session_3.1.pdf

- Mathematics of Forest Management and Policy, Bioenergy and CO2: Optimization of combined decisions
- http://www.lohmander.com/PL_UPV_2010/Math_PL_UPV_Feb2010.ppt

- Optimal timing and spatial coordination with infrastructure: The case of Russian Federation
- http://www.lohmander.com/RuMa09/Lohmander_Presentation.ppt
- http://www.lohmander.com/RuMa09/RuMa09.htm

- Optimal timing and coordination with industrial investments in high resolution: The case of Sweden
- http://www.lohmander.com/London09/London_Lohmander_09.ppt
- http://www.lohmander.com/London09.pdf

- A Global Approach to Forest Management and Policy, Bioenergy and CO2
- http://www.lohmander.com/IntPres091007.ppt
- http://www.lohmander.com/jp090805.pdf

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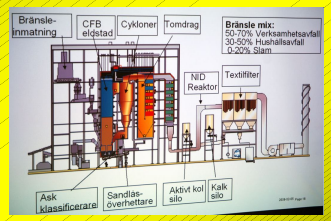
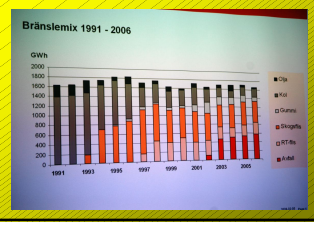
CHP, Combined Heat and Power: Illustrations and typical figures from one plant in Sweden

http://www.lohmander.com/NorrkopingDec08/NorrkopingDec08.htm





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Forest Management and Policy, Bioenergy and CO2: Briefing and graphs

http://www.lohmander.com/Nancy08/Nancy08.ppt

http://www.gip-ecofor.org/docs/nancy2008/ppt_des_presentations_orales/lohmander_session_3.1.pdf

Optimal dynamic control of the forest resource with changing energy demand functions and valuation of CO2 storage

Presentation at the Conference:

The European Forest-based Sector:
Bio-Responses to Address New Climate and Energy Challenges?
Nancy, France, November 6-8, 2008

By

Peter Lohmander

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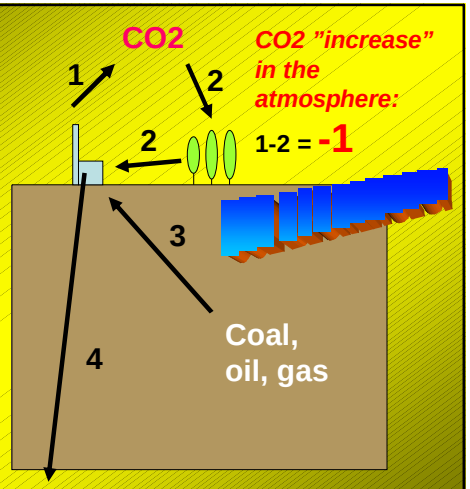
If we use CCS with 80% efficiency and use the forest with increased harvesting and high intensity silviculture.



CO2 "increase" in the atmosphere:

1-2 = **-1**

Permanent storage of CO2

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Economic valuation of CO2 storage in the natural resource

Economic Valuation of the Production of Energy and Other Industrial Products

$$\max\left\{J=\int_{t_1}^{t_2}e^{-rt}\left(\left(f_1+f_2t\right)x+\left(k_1+k_2t\right)u+k_3u^2\right)dt\right\}$$

The Total Economic Result (Present Value)

The Stock Level

The "Control" Level

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Optimal CCS, Carbon Capture and Storage, Under Risk

The objective function is the total present value of CO2 storage minus CCS costs.

$$\int_0^{\infty}e^{-rt}\left(k_1u+k_2u^2+f_1x+f_2x^2\right)dt$$

Discounting factor

u = control = CCS level

x = The total storage level of CO2

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The controlled storage

A stochastic differential equation:

$$dx=\left(u-Lx-S\right)dt+\sigma x\,dz$$

Change of the CO2 storage level.

Control = CCS level.

Expected CO2 leakage.

The CO2 storage level is to some extent affected by stochastic leakage and other stochastic events. Z = standard Wiener process.

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Mathematics of Forest Management and Policy, Bioenergy and CO2: Optimization of combined decisions
http://www.lohmander.com/PL_UPV_2010/Math_PL_UPV_Feb2010.ppt

A general continuous global approach to: - Optimal forest management with respect to the global warming problem and global economics

One section of the lectures by Peter Lohmander at UPV, Polytechnical University of Valencia, Spain, February 2010

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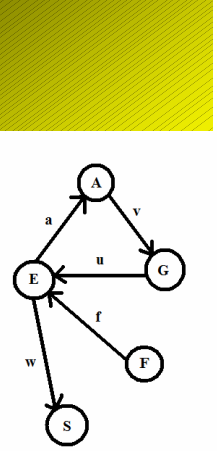

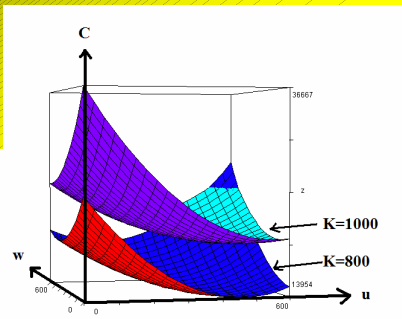

$$\min_{u,w} C = C_u(u) + C_f(f) + C_a(a-v) + C_w(w)$$

s.t.

$$u + f = K \quad \Rightarrow f = K - u$$

$$w + a = K \quad \Rightarrow a = K - w$$

$$v = u$$

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Optimal timing and spatial coordination with infrastructure: The case of Russian Federation
http://www.lohmander.com/RuMa09/Lohmander_Presentation.ppt
http://www.lohmander.com/RuMa09/RuMa09.htm

Methodology for optimization of coordinated forestry, bioenergy and infrastructure investments with focus on Russian Federation

Методология оптимизации координированных инвестиции в лесное хозяйство, биоэнергетику и инфраструктуры на примере РФ

Peter Lohmander
Professor Dr., SUAS, Umea, SE-90183, Sweden

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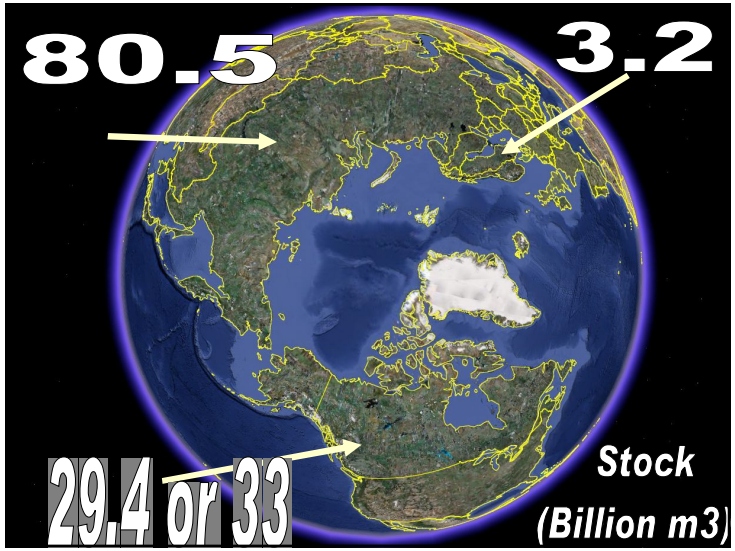
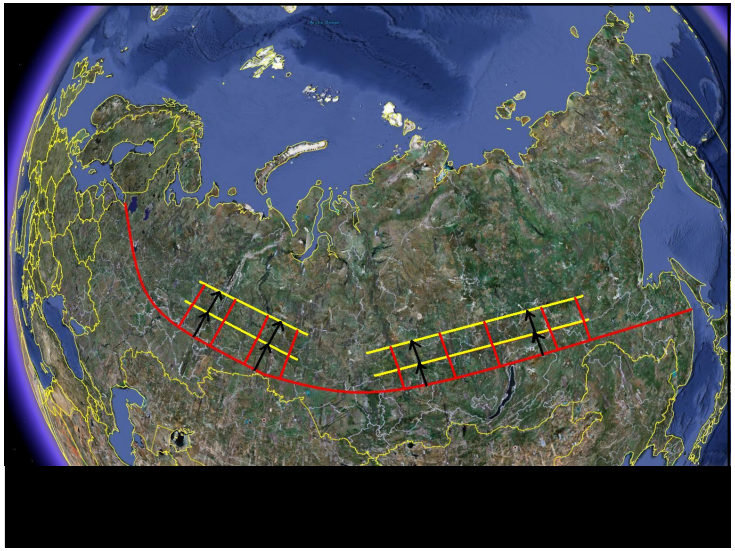
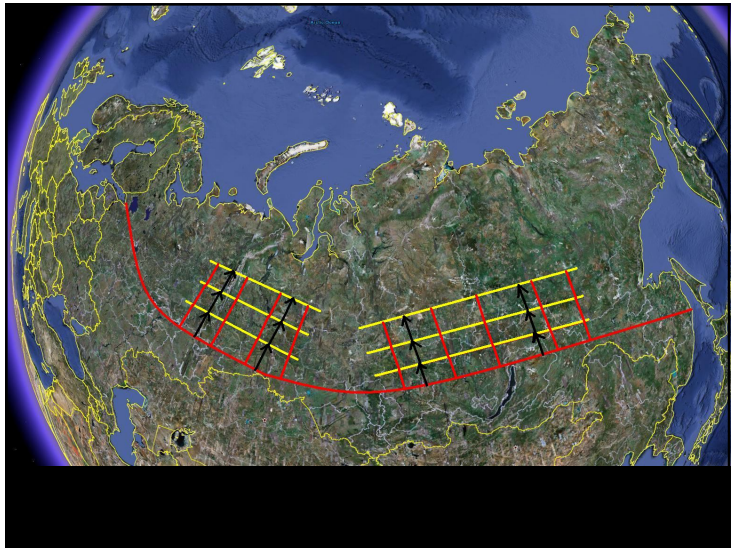


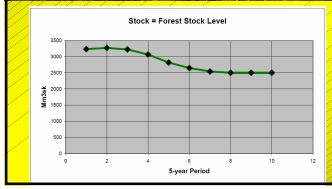


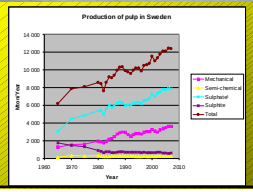


Optimal timing and coordination with industrial investments in high resolution: The case of Sweden

http://www.lohmander.com/London09/London_Lohmander_09.ppt

http://www.lohmander.com/London09.pdf





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#2 To allow students who do not have the possibility to participate in a mobility scheme, **to benefit from the knowledge and expertise** of academic staff from higher education institutions and from invited staff of enterprises in other European countries;

- The "UPV International Master Students" were course participants when Peter Lohmander, SLU, Sweden, gave lectures at UPV, February 2008. Dean and Professor Eduardo Rojas-Briales (right), presently Head of Forest Dept., FAO, Rome, Italy, is found in the first row.

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#3 To promote exchange of expertise and experience on **pedagogical methods**;

- Peter Lohmander (left), SLU, Sweden, has given a lecture at UPV. Dean and Professor Eduardo Rojas-Briales (right), presently Head of Forest Dept., FAO, Rome, Italy. (February 2008)

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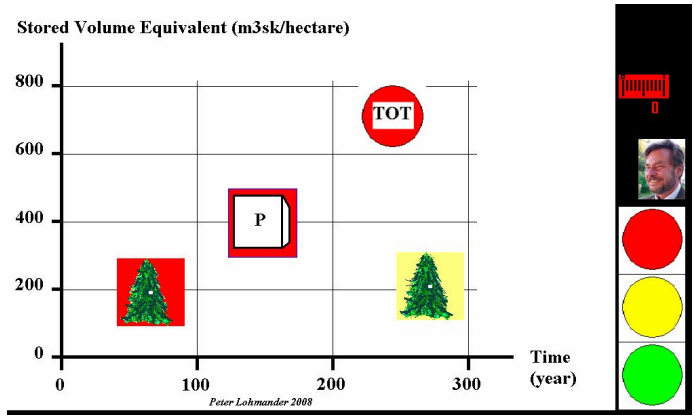

A new interactive simulation model was created to describe combined forestry and energy strategies that influence CO2 and global warming.

- **Link:** http://www.lohmander.com/CO2ill2/CO2ill2.htm

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#4 To **create links** between higher education institutions and with enterprises;

International Forest Policy Excursion Spain-Andorra-France 2008

35 students from Sweden followed the excursion.

The course was given as part of the Forestry Programme in Sweden.

The excursion was a part of the course: SH0026 International Forest Policy.

http://www.lohmander.com/IFP08/IFP08.html

http://www.lohmander.com/SAF08/SAF08.htm

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International Forest Policy Excursion to Spain-Andorra-France of the Forestry Students (Jägmästare of the Future!) from the Faculty of Forest Sciences, SLU, Umea, Sweden, April 15-25, 2008

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Dean and Professor Eduardo Rojas-Briales, UPV, gives a lecture in a Spanish oak forest. Swedish and Spanish forestry students participate.

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Saw mill visit in southern France, ***International Forest Policy Excursion to Spain-Andorra-France of the Forestry Students (Jägmästare of the Future!) from the Faculty of Forest Sciences, SLU, Umea, Sweden, April 15-25, 2008***

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Research Project
Department of Forest Economics
Swedish University of Agricultural Sciences

Economically optimal coordinated expansion of district heating, CHP and bioenergy in a region

Raul Fernandez Lacruz

Forest Engineer
School of Agricultural Engineering (ETSIA)
Polytechnic University of Valencia (UPV)

Director: Professor Dr. Peter Lohmander
Co-director: Mr. Miguel Fabra Crespo

Umeå, Sweden, September 2010

Raul Fernandez Lacruz from UPV obtained a EU scholarship and worked with Peter Lohmander one semester. He wrote a report. Later, he was awarded the price at UPV for the best master thesis (to the left).

LINK: http://www.lohmander.com/Lacruz_sept_2010.pdf

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Spatial dynamic optimization of district heating and/or cooling systems based on forest resources

Peter Lohmander
Professor Dr., SUAS, Umea, SE-90183, Sweden Peter@Lohmander.com

14th SSAFR
Systems Analysis in Forestry,
Reñaca, Chile,
March 8-11, 2011

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Lohmander, P., DHINV, Program for dynamic optimization of district heating and cooling systems investments in a region, Appendix 4 in:

Lacruz, R.F., Economically optimal coordinated expansion of district heating, CHP and bioenergy in a region, SLU, Umea, Dept. of Forest Economics, September, 2010

http://www.Lohmander.com/Lacruz_sept_2010.pdf

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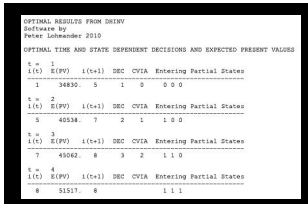

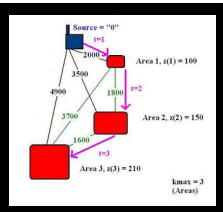

Rational and sustainable international policy for the forest sector
- with consideration of energy, global warming, risk, and regional development

Preliminary Plan 2009-08-05

TO THE NATIONAL COORDINATORS:
THIS IS A PRELIMINARY VERSION! PLEASE READ EVERYTHING FROM ALL COUNTRIES. INVESTIGATE THE TEXT AND CONSIDER IF YOU WANT TO UPDATE THE SECTION OF YOUR COUNTRY. FEEL FREE TO SUGGEST ANY CHANGES!

Contact:
Project Coordinator: Professor Peter Lohmander, SLU, SE-901 83 Umea, Sweden, Peter@Lohmander.com

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Spain

CONSIDERATIONS FORM A SPANISH PERSPECTIVE
Draft 1

1 General information

Spain has suffered since the oil crisis of 1973 a strong energy dependence. The domestic sources of oil are neglectable and of coal of a bad quality and high extraction costs. Imports of oil, gas and coal are one of the main imports of the Spanish economy. Nuclear energy has a significant contribution but due to the moratoria applied most of the 10 plants are almost outfacing. Renewable energy has been identified and promoted by strong public policies only in the past 5 years. Nevertheless the development has been significant, being Spain the 2nd country in the World in wind energy. The fluctuations of the wind force and the inflexibility of nuclear plants generate problems of insufficient or excessive offer regarding to the demand.

5 Contact information

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E-46022 Valencia
Tel: (+34)963877000 (ext. 73332)
Fax: (+34)963877339
GSM (+34)639313006) Int: 13332
e-mail: edrobr@prv.upv.es

- http://www.lohmander.com/ip090805.pdf

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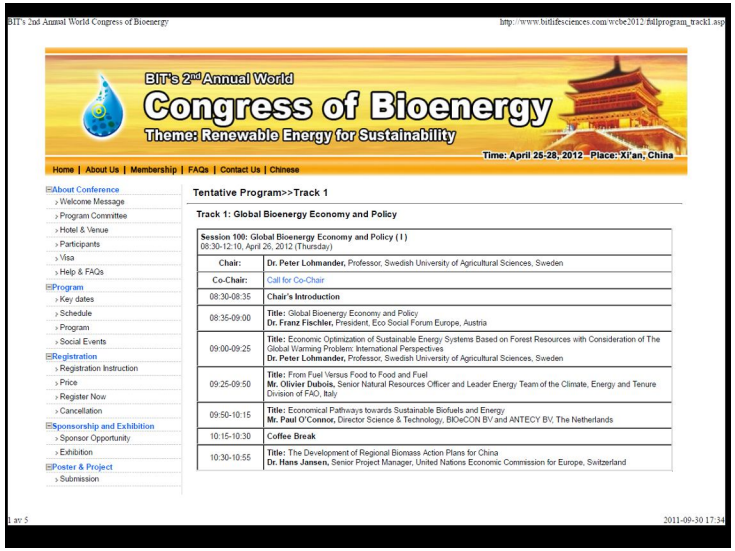

Conclusions:

All of the **objectives of staff mobility for teaching have been satistied.**

#1 To encourage higher education institutions to **broaden and enrich the range and content of courses** they offer;

#2 To allow students who do not have the possibility to participate in a mobility scheme, **to benefit from the knowledge and expertise** of academic staff from higher education institutions and from invited staff of enterprises in other European countries;

#3 To promote exchange of expertise and experience on **pedagogical methods**;

#4 To **create links** between higher education institutions and with enterprises;

#5 To motivate **students and staff to become mobile** and to assist them in preparing a mobility period.

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IMPORTANT strategies for SLU:

- **Continued focus on "ERASMUS Staff Mobility for Teaching".**
- **Investigate the best education programmes in the visited countries.**
- **Make sure that the master level education programmes at SLU are *at least* as advanced as the best master level education programmes in other countries. (Compare next point.)**
- **The level of mathematics within the forest programme has to increase at SLU in order to reach the level at UPV. At UPV, all forest engineering students study differential equations and other higher level mathematics.**
- **Differential equations are necessary tools in order to understand and analyze biological growth, economic growth etc. (VERY IMPORTANT AREAS AT SLU!) At SLU, differential equations are not studied within the forestry programme.**
- **At SLU, it would be rational to include a ten week course in applied mathematics during the first year, including differential equations and operations research, general optimization and programming. Then, the theoretical levels of almost all other courses could be strongly increased.**

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Pictures from UPV, Valencia and the Environment, by Peter Lohmander

- http://www.lohmander.com/ValenciaF08/UPV/UPVF08.htm
- http://www.lohmander.com/ValenciaF08/Valencia08.htm
- http://www.lohmander.com/SAF08/SAF08.htm

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