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Background

The forum aims to draw on lessons from current work conducted by the OECD, Cedefop, and other research and international organisations on the implications of the green economy for skills development and training policies. These insights will contribute to the OECD's *Green Growth Studies* such as the LEED projects on *Measuring the Potential of Green Growth*, *Improving the effectiveness of green local development initiatives* and to Cedefop's *Green Skills activities*, which contribute to the European Commission's initiative on *New Skills for New Jobs*. The Forum also provides insights for the Rio+20 process and the G20 pillar on the "Framework for Strong, Sustainable and Balanced Growth" and the G20 work on "Development".

A transition to a low carbon economy is only possible by developing the skills, knowledge and competences required by resource-efficient, sustainable processes and technologies, and integrating these into our businesses and communities. While effective development strategies and activities for these skills are necessary to achieve green growth, their success relies on an integrated approach with other areas of workforce development and public policy.

The Green Skills forum is an opportunity to gather the latest insights on (1) what firms, trade unions and other organisations are already doing to foster the potential of green growth through skills development activities; (2) how strategies for green skills are integrated with other areas of workforce development and (3) tools and directions for further research.

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The aim of this international forum of researchers, government advisers, employment and policy analysts and social partners actively involved in skills development and training needs for a low carbon economy is to review and discuss new research and policy approaches to foster a greener, more sustainable future.

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The conference papers, discussions and exchanges are expected to:

- facilitate the understanding of the limitations and potentials inherent in research and policy approaches tackling key skills issues for a successful transition to a low carbon economy;
- compare methods and tools used in monitoring and evaluating developments in the green economy and local labour markets;
- indicate how research can support better targeted policy making and skills strategies;
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GreenSkills Forum team 



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Skills for a Low Carbon Economy:

what next?

27 FEB. 2012 | PARIS, FRANCE



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Registration



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Forum Agenda



Monday, 27 February 2012

09:00 - 09:30	Registration
09:30 - 09:45	<p>Welcome</p> <p>Yves Leterme, Deputy Secretary-General, OECD Pascaline Descy, Head of Area Research and Policy Analysis, Cedefop</p>
09:45 - 10:15	<p>Introductory Panel</p> <p><i>Facilitator:</i> Cristina Martinez-Fernandez, OECD CFE LEED</p> <p>Skills for a low carbon economy</p> <p>Presentation OECD LEED Chris Barrett, Ambassador and Permanent Representative, Australian Delegation to the OECD Luc Willems, Deputy Secretary General, Benelux Secretariat</p> <p>Presentation Cedefop Antonio Ranieri, Cedefop</p> <p>Q&A</p>
10:15 - 11:30	<p>Session I: Gearing up education and training for green growth</p> <p><i>Facilitator:</i> Paul Eckins, University College of London, United Kingdom</p> <ul style="list-style-type: none"> How best can we enable education and training systems to adjust to emerging areas of green growth and stimulate diverse pathways to green jobs? What measures can be taken to make pathways to green jobs more attractive, particularly to women and young people, and to stimulate entrepreneurship in this field? <p>Knowledge sharing in early identification of skill needs Christine Hofmann, ILO</p> <p>The Austrian Masterplan human resources for renewable energies Gerhard Geiger, 3S Unternehmensberatung GmbH, Austria and Regina Steiner, FORUM Umweltbildung, Austria</p> <p>Think global, act local: the case for a global green skills training action plan Joel Marsden, GHK, United Kingdom</p> <p><i>Discussant:</i> Ray Pinto, Microsoft Europe, Middle East and Africa (BIAC) and Kathrin Hoeckel, OECD EDU</p> <p>Open Discussion</p>
11.30-12:00	Tea/Coffee break
12:00 - 13:15	<p>Session II: Enterprise approaches for a workforce fit for a green economy</p> <p><i>Facilitator:</i> Petra Schwager, UNIDO and DCED WGGG</p> <ul style="list-style-type: none"> What good practices are there to enhance the skills of the existing workforce to adapt to and benefit from a greener economy? How SMEs are equipping their workforce and talent? Which tools and activities do businesses use to anticipate and monitor market development in the green sector for their occupational requirements and skill needs? <p>Greening technical vocational education and training in the European steel industry Antonius Schröder, Technische Universität Dortmund – Sozialforschungsstelle, Germany</p> <p>Anticipating and managing the effects of greening of industries in the EU: skills development in the overall context of job quality</p>

[Simonas Gaušas](#), PPMI, Lithuania and [Radosław Owczarzak](#), Eurofound
Licensing and certification to increase skills provision amongst low carbon SMEs in the UK
[Nick Jagger](#), Centre for Climate Change Economics and Policies, United Kingdom

Discussant: [Roland Schneider](#), TUAC and [Lucia Cusmano](#), OECD CFE SME

[Open Discussion](#)

13:15 - 14:30 : Lunch

14:30 - 15:45 Session III: Integrating skills into local development strategies for green job creation

Facilitator: [Robert Strauss](#), DG Employment, Social Affairs & Inclusion, European Commission

- What best practices exist for integrating skills development strategies with other areas of public policy to promote green growth, particularly at local level?
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Greening local economies through stakeholders' mobilisation. Lessons from the project 'Employment houses and sustainable development in France'

[Marie-Pierre Establie d'Argencé](#), Alliance Villes Emploi, France

Identification of skill shortages, achieving policy coherence: the case of India

[Sunita Shanghi](#), Planning Commission, Government of India

Climate change adaptation and local development. The new imperatives for green skills development

[Rao Pinninti](#), Rutgers University, USA

Discussant: [Paul Swaim](#), OECD ELS and [Wolfgang Mueller](#), German Federal Employment Agency

[Open Discussion](#)

15:45 - 16:00 : Tea/Coffee break

16:00 - 17:15 Panel Session: Lessons learnt and the way forward

Facilitator: [Sergio Arzeni](#), OECD CFE

[Cristina Martinez-Fernandez](#), OECD CFE LEED

[Paul Ekins](#), University College of London, United Kingdom

[Petra Schwager](#), UNIDO and DCED GGWG

[Robert Strauss](#), DG Employment, Social Affairs & Inclusion, European Commission

[Antonio Ranieri](#), Cedefop

[Open Discussion](#)

17.15 - 17.30 Closure

[Pascaline Descy](#), Head of Area Research and Policy Analysis, Cedefop

[Sylvain Giguère](#), Head of the OECD LEED Division

17.30 : End of conference

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Practical information



Conference Organisers

Cedefop and OECD LEED Programme

Conference Secretariat

Cedefop

e-mail: GreenSkills-Forum2012@cedefop.europa.eu

Secretariat and information desk during the conference

The Secretariat desk will be located at the conference venue, and will operate:

Monday 27 February 2012, 9.00 - 18.00

Malika Taberkane: + 33 1 45 24 92 56

Conference Venue

OECD – Organisation for Economic Co-Operation and Development
2, rue André-Pascal, 75016 Paris.

Metro (line 9): La Muette. RER C: Boulanvilliers or Henri Martin.

Meeting Room: The meeting will take place at the OECD Conference Centre, Room Auditorium.

For external participants - please arrive at the OECD Conference Centre 15 minutes in advance to allow for security checking and collect your badge. Please bring an ID and ask for Malika Taberkane (+ 33 1 45 24 92 56) in case of problems.

Information about how to find the OECD and other relevant information can be found by clicking on the following link:

http://www.oecd.org/site/0,3407,en_21571361_39789995_1_1_1_1_1,00.html.

Hotels

It is up to each delegate to arrange his/her own hotel reservation.

You can find a list of hotels closed to the OECD following this link: http://www.oecd.org/document/1/0,3746,en_21571361_39789995_39792769_1_1_1_1,00.html . The hotels information is provided for convenience only and does not constitute an endorsement or recommendation by the OECD of the services of a particular hotel.

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Speakers



Arzeni	Sergio	more	OECD CFE
Barrett	Chris	more	Australian Delegation to the OECD
Cusmano	Lucia	more	OECD CFE SME
Descy	Pascaline		Cedefop
Ekins	Paul		University College of London
Establie d'Argencé	Marie-Pierre		Alliance Villes Emploi, France
Gaušas	Simonas		Public Policy and Management Institute, Lithuania
Geiger	Gerhard		3S Unternehmensberatung GmbH, Austria
Giguere	Sylvain		Head of OECD CFE LEED Division
Hoeckel	Kathrin		OECD EDU
Hofmann	Christine		ILO
Jagger	Nick		Centre for Climate Change Economics and Policies, UK
Leterme	Yves		OECD
Marsden	Joel		GHK, United Kingdom
Martinez-Fernandez	Cristina		OECD CFE LEED
Mueller	Wolfgang		German Federal Employment Agency
Owczarzak	Radoslaw		Eurofound
Pinninti	Rao		Rutgers University, USA
Pinto	Ray		Microsoft Europe, Middle East and Africa (BIAC)
Ranieri	Antonio		Cedefop
Schneider	Roland		TUAC
Schröder	Antonius		Technische Universität Dortmund – Sozialforschungsstelle, Germany
Schwager	Petra		UNIDO and DCED GGWG
Shanghi	Sunita		Planning Commission Government of India, India
Steiner	Regina		FORUM Umweltbildung
Strauss	Robert		European Commission
Swaim	Paul		OECD ELS
Willems	Luc		Benelux Secretariat

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Presentations



Presentation template

PPT PRESENTATIONS – SUMMARY TABLE

	Introductory Panel
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10:15 - 11:30	Session I: Gearing up education and training for green growth
PAPER I-A	<p>Knowledge sharing in early identification of skill needs Christine Hofmann, ILO</p>
PAPER I-B	<p>The Austrian Masterplan human resources for renewable energies Gerhard Geiger, 3S Unternehmensberatung GmbH</p>
PAPER I-C	<p>Think global, act local: the case for a global green skills training action plan Joel Marsden, GHK, United Kingdom</p>
PAPER I-D	<p>Skills for disruptive innovation Ray Pinto, Microsoft Europe, Middle East and Africa (BIAC)</p>
12:00 - 13:15	Session II: Enterprise approaches for a workforce fit for a green economy
PAPER II-A	<p>Greening technical vocational education and training in the European steel industry Antonius Schroeder, Technische Universität Dortmund – Sozialforschungsstelle, Germany</p>
PAPER II-B	<p>Anticipating and managing the effects of greening of industries in the EU: skills development in the overall context of job quality Simonas Gausas, PPMI, Lithuania and Radoslaw Owczarzak, Eurofound</p>
PAPER II-C	<p>Licensing and certification to increase skills provision amongst low carbon SMEs in the UK Nick Jagger, Centre for Climate Change Economics and Policies, United Kingdom</p>
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PAPER III-B	<p>Identification of skill shortages, achieving policy coherence: the case of India Sunita Shanghi, Planning Commission Government of India, India</p>
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Abstracts



ABSTRACTS – SUMMARY TABLE

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All Abstracts (, 209 KB)



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Cristina Martinez-Fernandez, OECD CFE LEED

Paul Ekins, University College of London, United Kingdom

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[Sylvain Giguère](#), Head of the OECD LEED Division

17.30 *End of conference*

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SKILLS FOR A LOW CARBON ECONOMY: **WHAT NEXT?**

27 February 2012, Paris, France

OECD Conference Centre, Room Auditorium

Agenda

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Open Discussion

15:45 - 16:00 | Tea/Coffee break

16:00 - 17:15 | Panel Session: Lessons learnt and the way forward

Facilitator: Sergio Arzeni, OECD CFE

Cristina Martinez-Fernandez, OECD CFE LEED

Paul Ekins, University College of London, United Kingdom

Petra Schwager, UNIDO and DCED GGWG

Robert Strauss, DG Employment, Social Affairs & Inclusion, European Commission

Antonio Ranieri, Cedefop

Open Discussion

17.15 - 17.30 | Closure

Pascaline Descy, Head of Area Research and Policy Analysis, Cedefop

Sylvain Giguere, Head of the OECD CFE LEED Division

17.30 | End of conference



SKILLS FOR A LOW CARBON ECONOMY: **WHAT NEXT?**

27 February 2012, Paris, France

OECD Conference Centre, Room Auditorium

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Contacts

Cedefop

Area Research and Policy Analysis

Europe 123

570 01 Thessaloniki (Pylea)

Greece

or

PO Box 22427

551 02 Thessaloniki

Greece

E-mail: skills-analysis@cedefop.europa.eu

WEB: www.cedefop.europa.eu

Organisation for Economic Co-operation and Development (OECD)

Centre for Entrepreneurship, SMEs and Local
Development (CFE)

Local Employment and Economic Development
Programme (LEED)

2, rue André-Pascal

75775 Paris Cedex 16

FRANCE

E-mail: contact.cfe@oecd.org

Web: www.oecd.org/cfe/leed

Scientific Coordination

Cedefop

Antonio Ranieri

Senior Expert

E-mail: Antonio.Ranieri@cedefop.europa.eu

OECD CFE LEED Programme

Cristina Martinez-Fernandez

Senior Policy Analyst

E-mail: Cristina.Martinez@oecd.org



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Cedefop

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Secretariat and information desk during the conference

The Secretariat desk will be located at the conference venue, and will operate:

Monday 27 February 2012, 9.00 - 18.00

Malika Taberkane: + 33 1 45 24 92 56

Conference Venue

OECD – Organisation for Economic Co-Operation and Development

2, rue André-Pascal, 75016 Paris.

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Tel: (+30) 2310 490078

Fax: (+30) 2310 490117

e-mail: GreenSkills-Forum2012@cedefop.europa.eu

Speakers



Arzeni	Sergio	more	OECD CFE
Barrett	Chris	more	Australian Delegation to the OECD
Cusmano	Lucia	more	OECD CFE SME
Descy	Pascaline		Cedefop
Ekins	Paul		University College of London
Establie d'Argencé	Marie-Pierre		Alliance Villes Emploi, France
Gaušas	Simonas		Public Policy and Management Institute, Lithuania
Geiger	Gerhard		3S Unternehmensberatung GmbH, Austria
Giguere	Sylvain		Head of OECD CFE LEED Division
Hoeckel	Kathrin		OECD EDU
Hofmann	Christine		ILO
Jagger	Nick		Centre for Climate Change Economics and Policies, UK
Leterme	Yves		OECD
Marsden	Joel		GHK, United Kingdom
Martinez-Fernandez	Cristina		OECD CFE LEED
Mueller	Wolfgang		German Federal Employment Agency
Owczarzak	Radoslaw		Eurofound
Pinninti	Rao		Rutgers University, USA
Pinto	Ray		Microsoft Europe, Middle East and Africa (BIAC)
Ranieri	Antonio		Cedefop
Schneider	Roland		TUAC
Schröder	Antonius		Technische Universität Dortmund – Sozialforschungsstelle, Germany
Schwager	Petra		UNIDO and DCED GGWG
Shanghi	Sunita		Planning Commission Government of India, India
Steiner	Regina		FORUM Umweltbildung
Strauss	Robert		European Commission
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Willems	Luc		Benelux Secretariat

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Sergio Arzeni



Sergio Arzeni is the Director of the OECD Centre for Entrepreneurship, Small and Medium-sized Enterprises (SMEs) and Local Development. The Centre oversees the work of the Local Economic and Employment Development programme (LEED), the Working Party on SMEs and Entrepreneurship, the Tourism Committee, and the OECD LEED Trento Centre for Local Development (Italy). Mr. Arzeni has worked at the OECD for over 20 years. Prior to joining the OECD, Mr. Arzeni served as an economist for the Italian Parliament, the Italian Trade Unions and the European Commission. As an economic journalist he has contributed to several Italian and international newspapers. He holds a First Class Honours Degree in Political Science from the University of Rome and specialised in Industrial Economics at the International University Institute of Luxembourg and in International Economic Relations at the Brookings Institution in Washington D.C., USA. He speaks French, Spanish, English, German and Italian.

Chris Barrett



Chris Barrett was born in 1969 and holds a Bachelor of Commerce, a Bachelor of Arts with Honours and a Masters in International Relations from the University of Melbourne, as well as a Masters in Public Policy from the Woodrow Wilson School of Public and International Affairs at Princeton University.

Mr. Barrett began his career with the Boston Consulting Group in Melbourne, where he worked from 1992 to 1996. From 1996 to 2002, he served as a senior adviser to then Opposition Leader the Honourable Kim Beazley MP. Between 2003 and 2007, Mr. Barrett held several positions with the Department of Premier and Cabinet in the State Government of Victoria, culminating as Deputy Secretary and Head of Cabinet Office. In 2007, he was appointed Chief of Staff to the Treasurer of Australia, the Honourable Wayne Swan MP, where he served until 2010.

Before his nomination as Ambassador and Permanent Representative of Australia to the OECD, Mr. Barrett was Australian Scholar at the Woodrow Wilson International Center for Scholars in Washington DC.

Ambassador Chris Barrett took up his duties as Permanent Representative of Australia to the OECD on 23 August 2011.

Lucia Cusmano



Lucia Cusmano is Senior Economist at the OECD Centre for Entrepreneurship, Small and Medium-sized Enterprises (SMEs) & Local Development (CFE) and Executive Secretary for the OECD Working Party on SMEs and Entrepreneurship (WPSMEE). Ms. Cusmano has a PhD in Economics from the University of Pavia (Italy) and has completed a Master of Science in Economics at Warwick University (UK). She has published extensively in international journals on SMEs, entrepreneurship, innovation, structural change, institutions and economic development in advanced and developing regions.

Ms. Cusmano holds the position of Assistant Professor of Political Economy at Insubria University, Varese (Italy) and Research Fellow at KITES (Knowledge, Innovation and Technology Studies), Bocconi University, Milan (Italy).

SPEAKERS' BIOGRAPHICAL NOTES

(in alphabetical order)



Sergio ARZENI is the Director of the OECD Centre for Entrepreneurship, Small and Medium-sized Enterprises (SMEs) and Local Development. The Centre oversees the work of the Local Economic and Employment Development programme (LEED), the Working Party on SMEs and Entrepreneurship, the Tourism Committee, and the OECD LEED Trento Centre for Local Development (Italy). Mr. Arzeni has worked at the OECD for over 20 years. Prior to joining the OECD, Mr. Arzeni served as an economist for the Italian Parliament, the Italian Trade Unions and the European Commission. As an economic journalist he has contributed to several Italian and international newspapers. He holds a First Class Honours Degree in Political Science from the University of Rome and specialised in Industrial Economics at the International University Institute of Luxembourg and in International Economic Relations at the Brookings Institution in Washington D.C., USA. He speaks French, Spanish, English, German and Italian.



Chris BARRETT was born in 1969 and holds a Bachelor of Commerce, a Bachelor of Arts with Honours and a Masters in International Relations from the University of Melbourne, as well as a Masters in Public Policy from the Woodrow Wilson School of Public and International Affairs at Princeton University.

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Ms. Cusmano holds the position of Assistant Professor of Political Economy at Insubria University, Varese (Italy) and Research Fellow at KITES (Knowledge, Innovation and Technology Studies), Bocconi University, Milan (Italy).



Pascaline DESCY is Head of Research and Policy Analysis, Cedefop (European Centre for the Development of Vocational Training). Ms. Pascaline Descy manages a team of experts working in European VET policy analysis, identifying skill needs in Europe and VET research.

She joined Cedefop in 1997 and worked for several years as an expert in VET research, in particular co-authoring Cedefop's Research Reports, which present comprehensive and critical reviews of VET-relevant socio-economic research and draw implications for policy.

In recent years, she has investigated the economic and social benefits to education, training and skills. Prior to joining Cedefop, Ms Descy was a researcher at the University of Liège in Belgium, where she was involved in comparative education projects. Pascaline Descy holds a Master's degree in education science from the University of Liège, Belgium.



Paul EKINS has a PhD in economics from the University of London and is Professor of Energy and Environment Policy at the UCL Energy Institute, University College London. He is also a Co-Director of the UK Energy Research Centre, in charge of its Energy Systems theme, and also leads UCL's involvement in large research consortia on Bioenergy and Hydrogen. His academic work focuses on the conditions and policies for achieving an environmentally sustainable economy, with a special focus on energy and climate policy, and the modelling of the energy system; on innovation; on the role of economic instruments such as environmental taxes; on sustainability assessment; and on environment and trade.

He has published 12 books and numerous articles and papers on these topics.



Marie-Pierre ESTABLIE D'ARGENCÉ has been the General Delegate of the "Alliance Villes Emploi" since it was founded in 1993. She also was at the origin of the "Employment Centres" concept in France and contributed to their development and spread in 2005 in the frame of the French "Social Cohesion Plan". She also initiated in 2008, together with the French Environment and Energy Management Agency (ADEME), the project "Employment Houses and Sustainable Development" on 33 territories in order to better think and anticipate climate change mitigation policies effects on employment and skills locally.



Simonas GAUŠAS is Research Manager in Public Policy and Management Institute. He has more than 7 years of work experience in public policy research including research of education (especially vocational education and training, adult learning, education financing issues) and labour market policies (especially issues related to the impact of climate change on employment, sectoral labour market trends and anticipation of skills needs of the economy). Currently he works in Eurofound project 'Growth and employment: Anticipating and managing the effects of greening of industries in the EU' (2011-2012), Cedefop study "Financing training in Europe" (2010 – 2012) and is a

country group expert in the Cedefop project "Forecasting Skill Supply and Demand in Europe" (2009-2012). Simonas holds a MA degree in European Public Administration from Vilnius University.



Gerhard GEIGER holds a Diploma in International Cultural and Business Studies and is currently working on a doctoral thesis with an interdisciplinary governance approach. He is project manager in research and consulting projects in the field of vocational education and training with a focus on upper secondary VET and the tertiary sector. Experience in quality assurance, quantitative and qualitative analyses of labour market needs; assessment of the matching of acquired skills in vocational training with occupational qualification needs in alumni census; support of universities and universities of applied sciences ("Fachhochschulen") in developing curricula, which anticipate current and prospective labour market needs.



Sylvain GIGUÈRE is Head of the Local Economic and Employment Development (LEED) Division since 2008. Based at the OECD Headquarters in Paris, he leads a team of 25 economists, researchers, statisticians and administrative assistants, which includes the OECD LEED Centre for Local Development in Trento, Italy, and shapes the development of the LEED programme of work.

A Canadian national, Sylvain joined the OECD in 1995, first to work in the Directorate for Employment, Labour and Social Affairs (DELSA). In 2002 he was appointed Deputy Head of the LEED Programme, where he developed a policy research agenda to help governments get better results by revamping their governance structures and increasing their ability to coordinate and target policy.



Kathrin HOECKEL is a policy analyst in the OECD's Directorate for Education in Paris/France where she is currently responsible for developing the OECD Skills Strategy.

From 2007 to 2010 she worked on the OECD VET Policy Review. She was responsible for country reviews of Australia, Austria, Germany, the UK (England and Wales) and Switzerland and for analytical work on costs and benefits in VET.

Prior to this activity, Kathrin worked on the issue of school leadership ('Improving School Leadership' OECD, 2008) and took part in writing the final comparative report and disseminating the findings of a thematic review on adult learning ('Promoting Adult Learning' OECD, 2005) at the OECD. Before joining the OECD, she worked in the field of development cooperation, inspecting and evaluating development projects of local NGOs in Morocco (including on special education and vocational education and training) and carried out a research project with field visits on post-war reconstruction and state-building in Lebanon.

Kathrin holds a M.Sc. in history and political science from Munich University (Germany) and a Master's degree in public administration from the London School of Economics and Political Science. Kathrin is of German nationality.



Christine HOFMANN has been working for the ILO Skills and Employability Department since 2006. She co-authored the book *Skills for green jobs. A global view*, arising from a global policy-applied research project covering 21 countries world-wide, in collaboration with Cedefop. She also participated in research on early identification of skill needs for the low-carbon economy, a joint ILO/EC management agreement, resulting in two sector studies and a comparative analysis of methods.

Apart from contributing to the ILO's Green Jobs portfolio, Christine has developed a resource guide on upgrading informal apprenticeship in Africa, delivers trainings and advises technical cooperation projects in countries in Asia and Africa. Before joining the ILO, she worked in political consulting and coordinated development projects for trade unions in Africa and Asia for a German labour foundation promoting social sustainability in national and international fora such as the UN CSD. She holds a degree in International Business and Area Studies.



Nick JAGGER is currently researching the role of low carbon skills in enabling the low carbon transition as part of the Centre for Climate Change Economics and Policy at the University of Leeds. He has previously researched high and intermediate level skills and international indicators of Human Resources for Science and Technology as well as a wide range of employment and technology policy related topics at the Institute for Employment Studies and the Science Policy Research Unit in Brighton.



Yves LETERME was appointed Deputy Secretary-General of the OECD on 8 December 2011. He is in charge of Social Affairs, Education, Governance and Entrepreneurship.

Before joining the OECD, Yves Leterme held a variety of political posts in Belgium at all levels and in all areas of government. After starting his career as an alderman in his home town of Ypres, he became a Deputy in the Chamber of Representatives, Group Chairman, National Secretary and Chairman of the CD&V party, Minister-President of the Flemish Government, Federal Senator, Deputy Prime Minister, Minister of the Budget and Mobility, Minister of Foreign Affairs and Prime Minister. Yves Leterme is currently Minister of State and a municipal councillor in Ypres. At a professional level, Yves Leterme has worked, inter alia, as a deputy auditor at the Belgian Court of Audit and an administrator at the European Parliament.

Yves Leterme, who was born on 6 October 1960, has a degree in Law and Political Science from the University of Ghent.



Joel MARSDEN is a Consultant with GHK. Joel is an Economist with 2 years of experience in providing research, analysis and evaluations of public policy across EU, national and regional government in the private and public sector. The primary focus of his work is on the linkages between environment, economic and education policy.

Joel has previously conducted research and policy analysis on green skills demand and the responsiveness of VET provision to match emerging trends, as well as providing advice on the development of the EU emissions trading system. At GHK, he is currently developing a catalogue of jobs and identifying skill needs in relation to EU biodiversity objectives for DG Environment. He is also leading research to establish good practice measures for VET to support sustainable development.



Cristina MARTINEZ FERNANDEZ is a Senior Policy Analyst specialised on Employment and Skills, Green Growth, Demographic Change, and Southeast Asia at the Organisation for Economic Co-operation and Development (OECD), Local Economic and Employment Development (LEED) programme. She works on issues related to the challenges of skills and training systems for SMEs, entrepreneurial and innovation activities; industrial policy, climate change and the transformation of labour markets into the low-carbon economy; the challenges of demographic changes and an ageing society for skills and employment development. Cristina also manages the OECD/LEED Initiative on Employment and Skills

Strategies in Southeast Asia (ESSSA). Before joining the OECD she was a Professor at the Urban Research Centre, University of Western Sydney in Australia where she led the Urban and Regional Dynamics programme which analyses industry change, urban performance and socio-economic development within the frameworks of innovation, globalisation and the knowledge economy. Cristina has university degrees on industrial psychology from the University of Salamanca, University Pontificia and UNED (Spain); she holds a Doctorate from Salamanca University and a PhD on Planning and Urban Development from the University of New South Wales (Sydney, Australia). She has published more than 100 works in international scientific journals, books and OECD policy reports. Cristina has Spanish and Australian nationalities.



Wolfgang MUELLER is the Director of the European Representation of the Bundesagentur fuer Arbeit, the German Federal Employment Agency. He is the advisor for European Affairs for the Director General. He was the Chair of the Working Group "New Skills for New Jobs" of the European Heads of Public Employment Services Network dealing also with Green Jobs/ Green Skills, he is representing the Network in the European Qualification Framework Advisory Group, the European Vacancy Monitor Advisory Group and the European Lifelong Guidance Policy Network. He will represent the European Heads of Public Employment Services Network in the network of observatories on Skills needs and mismatches of the

European Skills Panorama. He participated in two EU-US-Roundtable on Skills, the EU-China Seminar on Green Jobs and the WAPES-China Seminar on Green Skills. He also participated in the EESC-Study Group on Green Jobs. He gave various presentations on the Green Jobs-/ Green Skills Agenda (e.g. EXPAK-Conference, European Employment Week).



Radosław OWCZARZAK is Research Manager in European Foundation for the Improvement of Living and Working Conditions (Eurofound), the European Union Agency based in Dublin, responsible for the Network of European Observatories, future oriented sector studies, research in the links between quality of work and performance, in the future skill needs, projects on undeclared work and on the impact of greening of industries on quantity and quality of jobs. A business economist, with a PhD in strategic management from Poznań University of Economics in Poland, a DESS in Finance and Banking from University Paris 2 and a certified Project Management Professional (PMP). Before joining Eurofound, he worked in academia, strategic consultancy and in the business management. He has been also involved in the NGOs promoting sustainable social development and education.



Rao PINNITI teaches at Bloustein School of Planning and Public Policy, Rutgers University, New Brunswick, USA. He has several years of research, teaching, consultancy and management experience in India and in the United States of America. He has been a consultant to several international organizations including the JICA, ILO, UNDP, World Resources Institute, and a few others.

He has published about a dozen books and several research papers, including “The Architecture of Green Economic Policies” (Heidelberg: Springer Verlag, 2010), and “International Trade Policies and Climate Change Governance” (Heidelberg: Springer Verlag, 2012). He served as a member of the National Policy Committee for Energy and Environment for the Obama-Biden campaign, and has also served on several committees and boards over the years, besides as Chairman of a public enterprise. He also initiated and organized a few international conferences including the top-level Indo-French Colloquium on Multi-Level Economic Planning.



Ray PINTO is the Lead on Government Policy for Environment for Microsoft Europe, The Middle East and Africa. Mr. Pinto can share his experiences on how technologies today are enabling solutions to reduce greenhouse gas emissions and providing advanced healthcare solutions. He can share insights in new technologies being developed in its global labs that are being developed to tackle some of the planet’s and society’s biggest challenges.

His environmental work encompasses working with non-governmental organizations such as The Climate Group and government agencies such as the United Nations (UNFCCC, UNEP, UNIDO) and the European Environment Agency in developing best practices and projects that will reduce the forces causing climate change and help societies adapt to their changing environment. Internet and Communication technologies are increasingly being used to understand and compute large amounts of data to tackle the complexity of the planet’s life support system, the interactions of biodiversity and ecology and reach large populations to raise awareness and change behavior. His work brings him into negotiations with governments around the world as they look for credible solutions in tackling issues around energy including increasing renewables, development of smart grids, electric vehicles or smart logistics all of which needs software in its development.



Antonio RANIERI is Project Manager at Cedefop within the Research and Policy Analysis area. An economist by training, Antonio Ranieri has taught regional and urban economics at the University of Roma. As Head of Area at CLES in Rome, an independent centre of studies on labour market and economic development issues, he coordinated research projects in the fields of policy design and evaluation of public investment. At Cedefop, where he has worked since 2010, Ranieri coordinates the project ‘Skill needs in sectors’, and his brief also covers skills forecasting, and labour market imbalances.



Roland SCHNEIDER is currently Senior Policy Advisor at the Trade Union Advisory Committee (TUAC) to the Organisation for Economic Co-operation and Development (OECD) in Paris. As an international trade union organization with members in all OECD countries, TUAC is the interface for labor unions with the OECD. It has consultative status with the OECD and its various committees. Subsequent to an apprenticeship as a toolmaker, Mr. Schneider completed studies in mechanical engineering as well as in political science and economics.

At the start of his professional career he conducted research focusing on technology assessment at the Economic and Social Research Institute (WSI) of the German federation of trade unions (DGB) in Düsseldorf, Germany.

At TUAC, he is in charge of employment and labor market policy issues as well as on education and training issues. He has published intensively on R&D, innovation, technological change and on technology assessment as well as on labour market and employment policy.



Antonius SCHRÖDER is a senior researcher and member of management board of the Sozialforschungsstelle sfs – Technische Universität Dortmund (Social Research Centre at the University of Technologies Dortmund), responsible for European Research. He has worked in and coordinated several European projects in the fields of vocational education and training, organisational and personnel development (including equality and diversity, multi-cultural aspects), industrial change, industrial relations and social dialogue. He is member of the European Steel Technology Platform ESTEP - Working Group 5 "People".



Petra SCHWAGER works for the Environmental Management Branch of the United Nations Industrial Development Organization (UNIDO). In 2004 she initiated UNIDO's Chemical Leasing activities. Since 1995 she has been involved in building-up UNIDO's global Cleaner Production Programme, which currently includes 47 countries. She has managed National Cleaner Production Centres and Programmes in more than 15 countries and developed UNIDO's Regional Cleaner Production Network for Latin America. Fostering Public-Private Partnerships and encouraging innovative approaches to sustainable chemicals management in developing and transition countries are additional fields of her work. She studied Economics at the Vienna University of Business Administration and Social Sciences and Environmental Management at the University of London.



Sunita SHANGHI, an officer of Indian Economic Service, is working at a Senior Management Level as Adviser in the Planning Commission, Government of India. She has more than 25 years of experience in different ministries of the Government of India. At present looking after the work relating to preparation of National Five Year Plans and issues pertaining to Labour, Employment and Manpower. She has been deeply associated with the Coordinated Action on Skill Development and other labour matters. She has done her Masters in Economics from Delhi University, India and Masters in Development Studies from University of East Anglia, United Kingdom.



Regina STEINER studied Biology and Environmental Studies. She holds a doctoral degree and wrote the dissertation on competence oriented education for teachers for Education for Sustainable Development. She is lecturer for higher education with a strong focus on Education for Sustainable Development, Education Science and, Action Research. She has led several projects on Education for Sustainable Development on national and European level. She is leader of the section of FORUM Umweltbildung in Salzburg.



Robert STRAUSS entered the European Commission in 1985. Spent the next 15 years in DG Industry/Enterprise working in the areas of steel, chemicals, cars and trade negotiations. Joined DG Employment in 2001 as head of the Knowledge Society unit. From 2004 until 2010, was Head of Unit for Employment Strategy. Since 1st January 2011, is Head of Unit for Employment Analysis providing analytical input into the employment related aspects of the Europe 2020 Strategy. Current priorities include the appropriate labour market measures for exit from the global crisis and ensuring job-rich recovery and growth and the employment aspects of the move to a low carbon economy.



Paul SWAIM is an Economist at the OECD where he has written extensively for the OECD Employment Outlook. His work has addressed such topics as wage inequality, job training, working time, employment protection legislation, wage-setting institutions, poverty dynamics, labour market effects of globalisation and the implications of the recent economic crisis for labour market and social policy, in addition to green jobs and skills. Before joining the OECD, Paul taught economics at the University of Massachusetts and held several research positions in the US Federal government. Paul has a Ph.D. in economics from MIT.



Luc WILLEMS has been the Deputy Secretary-General of the Benelux Union, an intergovernmental organisation headquartered in Brussels, since 2009. Prior to this he held political mandates on the international, national and local levels. During the period 1995-1999 he was a member of the Belgian Chamber of Representatives and from 2003-2007 a member of the Belgian Senate. As senator he was chairman of the Finance and Economics Committee and deputy chairman of the Justice Committee. Luc Willems graduated with a Master in Law from the Catholic University of Leuven and earned a postgraduate degree in Financial Law at the Catholic University of Brussels. As a lawyer he specialised in economic law.

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PPT PRESENTATIONS – SUMMARY TABLE

	Introductory Panel
	<p>Measuring the Potential of Green Growth <i>Luc Willems</i>, Deputy Secretary General, Benelux Secretariat</p> <p>Cedefop approach and projects on green skills and VET policies <i>Antonio Ranieri</i>, Cedefop</p>
10:15 - 11:30	Session I: Gearing up education and training for green growth
PAPER I-A	<p>Knowledge sharing in early identification of skill needs <i>Christine Hofmann</i>, ILO</p>
PAPER I-B	<p>The Austrian Masterplan human resources for renewable energies <i>Gerhard Geiger</i>, 3S Unternehmensberatung GmbH</p>
PAPER I-C	<p>Think global, act local: the case for a global green skills training action plan <i>Joel Marsden</i>, GHK, United Kingdom</p>
PAPER I-D	<p>Skills for disruptive innovation <i>Ray Pinto</i>, Microsoft Europe, Middle East and Africa (BIAC)</p>
12:00 - 13:15	Session II: Enterprise approaches for a workforce fit for a green economy
PAPER II-A	<p>Greening technical vocational education and training in the European steel industry <i>Antonius Schroeder</i>, Technische Universität Dortmund – Sozialforschungsstelle, Germany</p>
PAPER II-B	<p>Anticipating and managing the effects of greening of industries in the EU: skills development in the overall context of job quality <i>Simonas Gausas</i>, PPMI, Lithuania and <i>Radosław Owczarzak</i>, Eurofound</p>
PAPER II-C	<p>Licensing and certification to increase skills provision amongst low carbon SMEs in the UK <i>Nick Jagger</i>, Centre for Climate Change Economics and Policies, United Kingdom</p>
14:30 - 15:45	Session III: Integrating skills into local development strategies for green job creation
PAPER III-A	<p>Greening local economies through stakeholders' mobilisation. Lessons from the project 'Employment houses and sustainable development in France' <i>Marie-Pierre Establie d'Argencé</i>, Alliance Villes Emploi, France</p>
PAPER III-B	<p>Identification of skill shortages, achieving policy coherence: the case of India <i>Sunita Shanghi</i>, Planning Commission Government of India, India</p>
PAPER III-C	<p>Climate change adaptation and local development. The new imperatives for green skills development <i>Rao Pinninti</i>, Rutgers University, USA</p>

E-mail this link to a friend.

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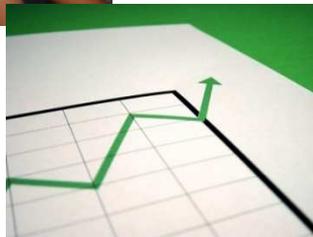
Sender:

Your E-mail:

Subject:

Skills for a Low Carbon Economy: **what next?**

Measuring the Potential of Green Growth



Luc Willems for OECD CFE LEED



l.willems@benelux.int

Paris, 27 February 2012



New Benelux Treaty

- Signed on : June 17th 2008
- Into force since : January 1st 2012



New Benelux Treaty

2 OBJECTIVES

- Expanding and deepening the cross-border cooperation
- Continuation of the cooperation as “laboratory” of the European integration

3 THEMES

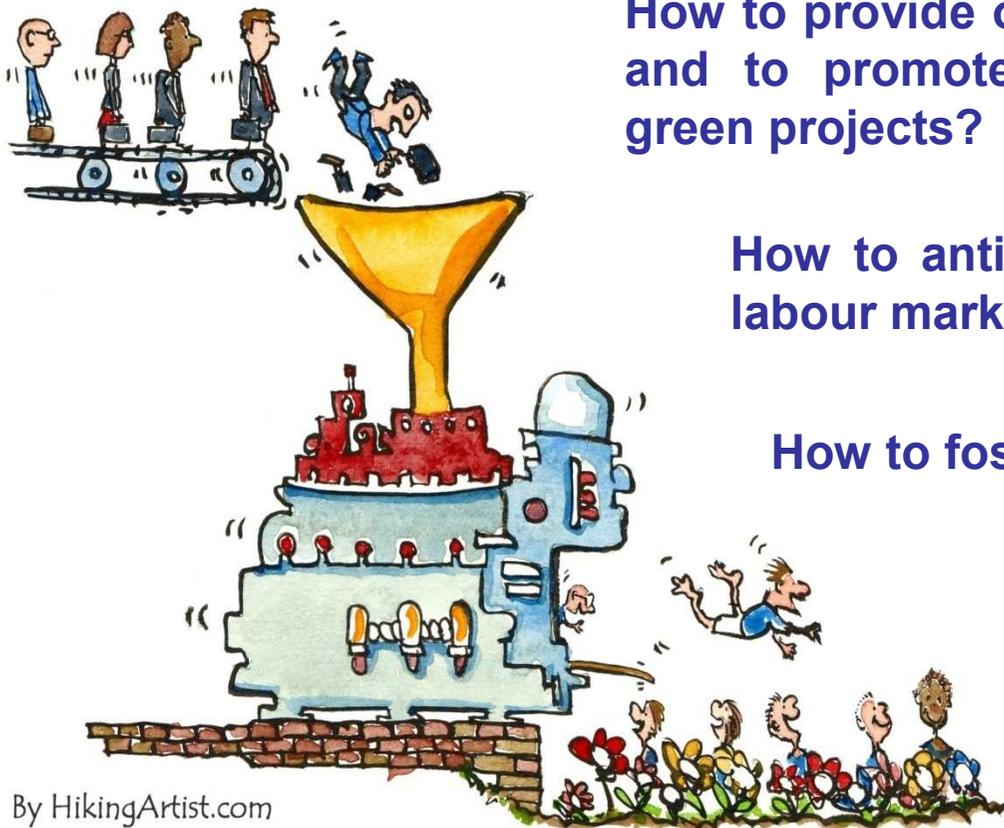
- Internal market and economic union
- Sustainable development
- Justice and Home affairs



5 INSTITUTIONS

- The committee of ministers, council, secretariat-general
- Benelux Parliament
- Court of Justice

Project: Measuring the Potential of Green Growth



By HikingArtist.com

How to provide optimal conditions for businesses and to promote public-private partnerships on green projects?

How to anticipate the demands of greening labour markets?

How to foster green job creation?

Which particular indicators can best inform of the potential of green growth for business development?

Project Partners

COPENHAGEN

CAPACITY

Copenhagen Capacity (lead partner) is the Danish Capital Region's official inward investment agency.

It works to promote the region internationally with the aim of attracting and retaining foreign companies and create jobs within a number of sectors, including cleantech.



The Growth Core Schönefeld Cross unites the capacities of the main communities embracing the new arising Berlin Brandenburg Airport (BER) with approx. 100.000 inhabitants.



The Benelux cooperation transcends the borders of Belgium, the Netherlands and Luxemburg.

On June 24th 2011 the Board of the Secretariat-General of the Benelux has given its final approval to the project "Indicators of Local Transition to a Low Carbon Economy in the Benelux". The project aims to define key indicators of a area-based transition to a low carbon economy in cross border regions in the Benelux.



Skills for a Low Carbon Economy:
what next?
27 FEB. 2012 | PARIS, FRANCE



Why be a partner ?

COPENHAGEN

CAPACITY

“... Copenhagen Capacity takes part in the project, not only to share its own experiences and knowledge, but also to learn from the outcomes of the final report and from the experiences and practices of the other participating regions.”



“ The OECD LEED project Indicators of local transition to a low carbon economy is precisely at this moment a very helpful tool in supporting cross border areas in their further development...”



“ The experiences and best practice given by global partners, experts and key actors of the LEED projects are so convincing in ways to achieve the maximum of sustainable regional development in our new emerging airport area that the local mayors decided to strengthen the co-operation with OECD Authorities on formal grounds.”



Skills for a Low Carbon Economy:
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Benelux Project

Measuring green growth in the framework of crossborder cooperation



- Belval
(Luxemburg-France)

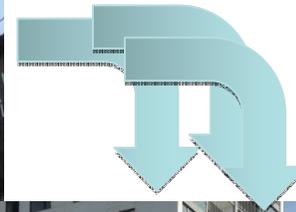


- Bio Based Europe Cluster
(Belgium-Netherlands)

Belval



A new campus on Belval



A new campus on Belval



The “Cité des Sciences, de la Recherche et de l’Innovation” will comprise:

- **University of Luxemburg:**
7.000 students
- **Public Research Centres:**
3.000 teachers/researchers
- **Investment: 1’000’000’000 €**

Bio Based Europe Cluster

Netherlands



Belgium



Bio Based Europe Cluster



-Partnership between Ghent Bio-Energy Valley and Biopark Terneuzen and stakeholders

-Boosts towards sustainable production processes and reducing the emission of greenhouse gases



- Bio Base Europe partnership transforms the region into the main bio-economy gateway in Europe

- Bio Base Europe consists of two parts:
- Pilot Plant (Ghent-B)
- Training Center (Terneuzen-NL)

Bio Based Europe Cluster



- no formal data existing on employment
- total employment of the cluster:
estimated 1350 employees:
 - 1000 in the industry
 - 350 researchers/policymakers
 - 50% administration facility management,
 - 20% production
 - 15% R&D
 - 10% sales
- 600 new jobs created the last five years
- average gross wage at least equal to the average of Belgium
- higher educated compared to the average



Thank you for your attention !



Skills for a Low Carbon Economy: **what next?**

Cedefop approach and projects on green skills and VET policies

Antonio Ranieri
Cedefop

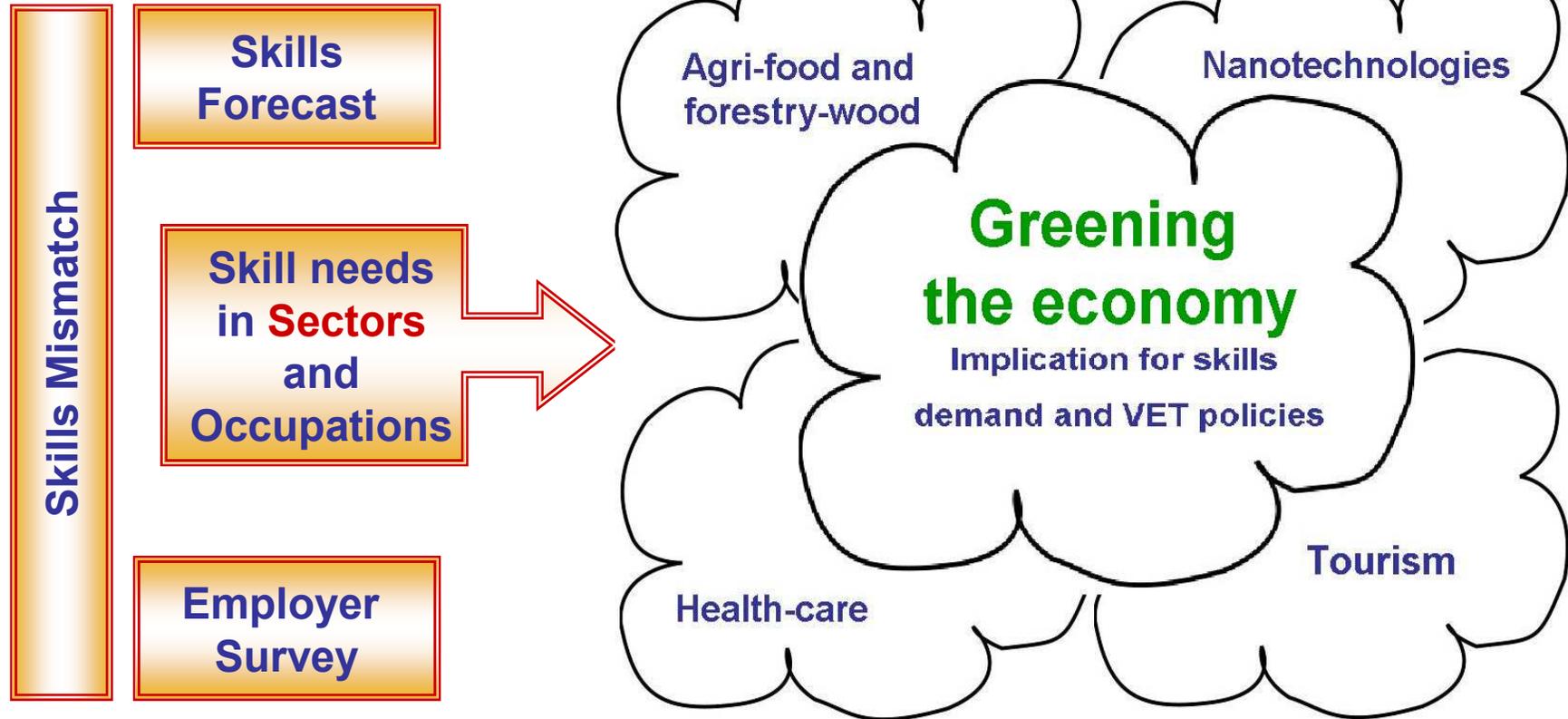
Antonio.Ranieri@cedefop.europa.eu

Paris, 27 February 2012

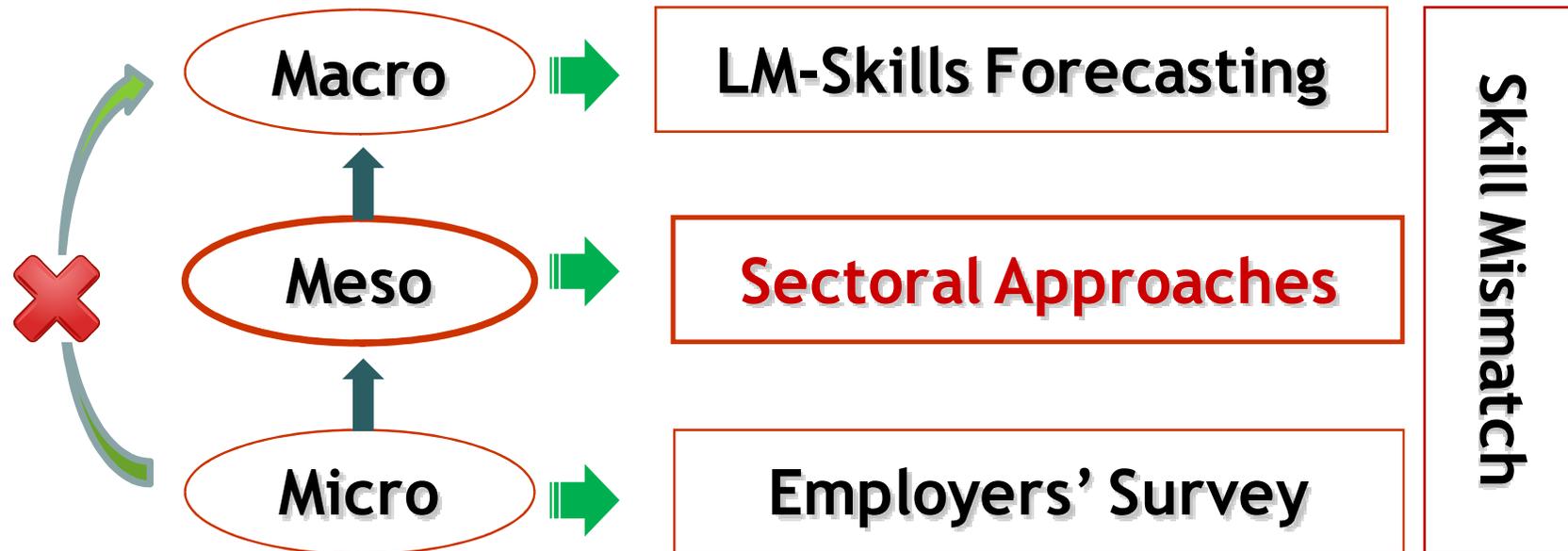


Identifying green skills – Cedefop's approach

Cedefop's skills team

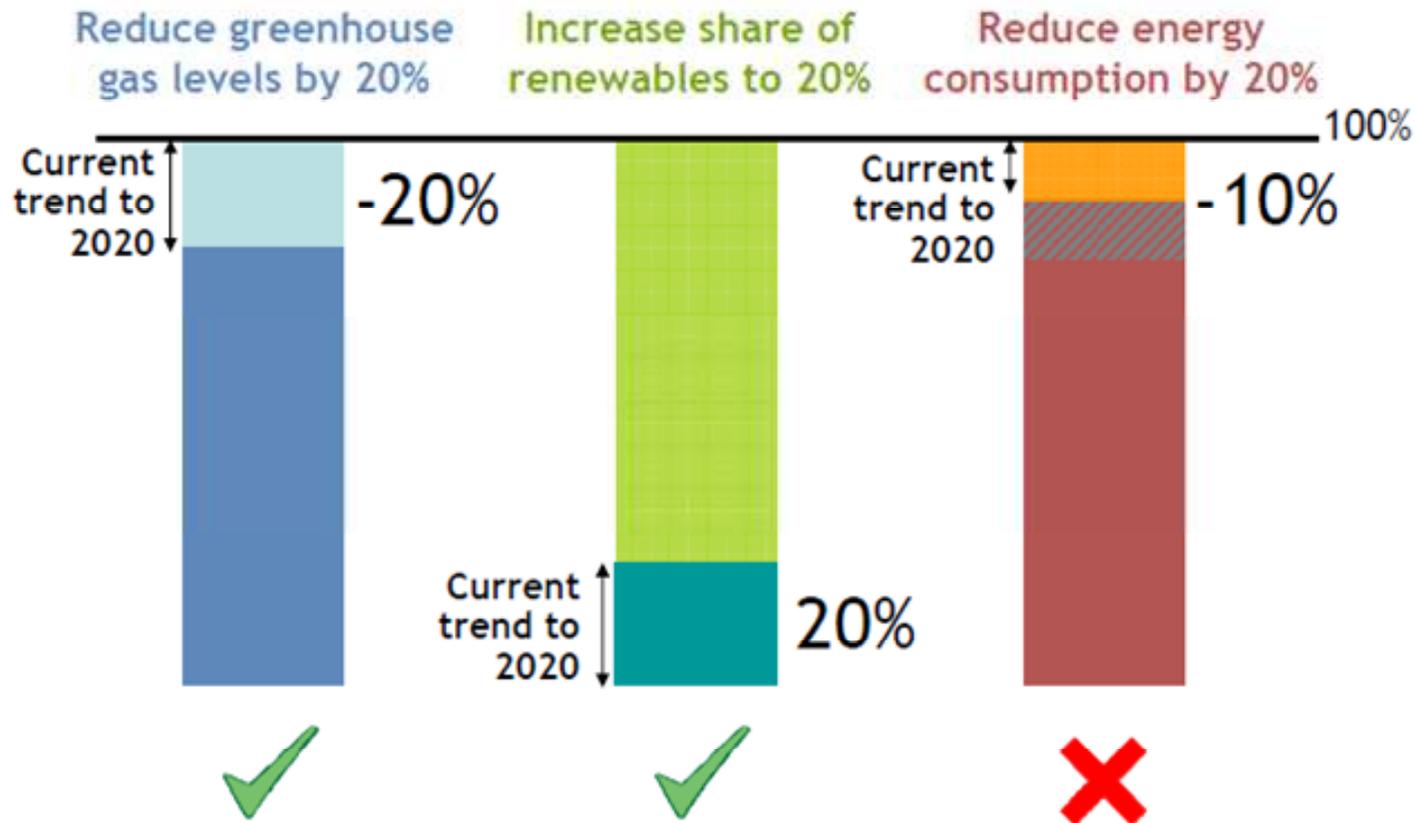


Identifying green skills – Cedefop's approach



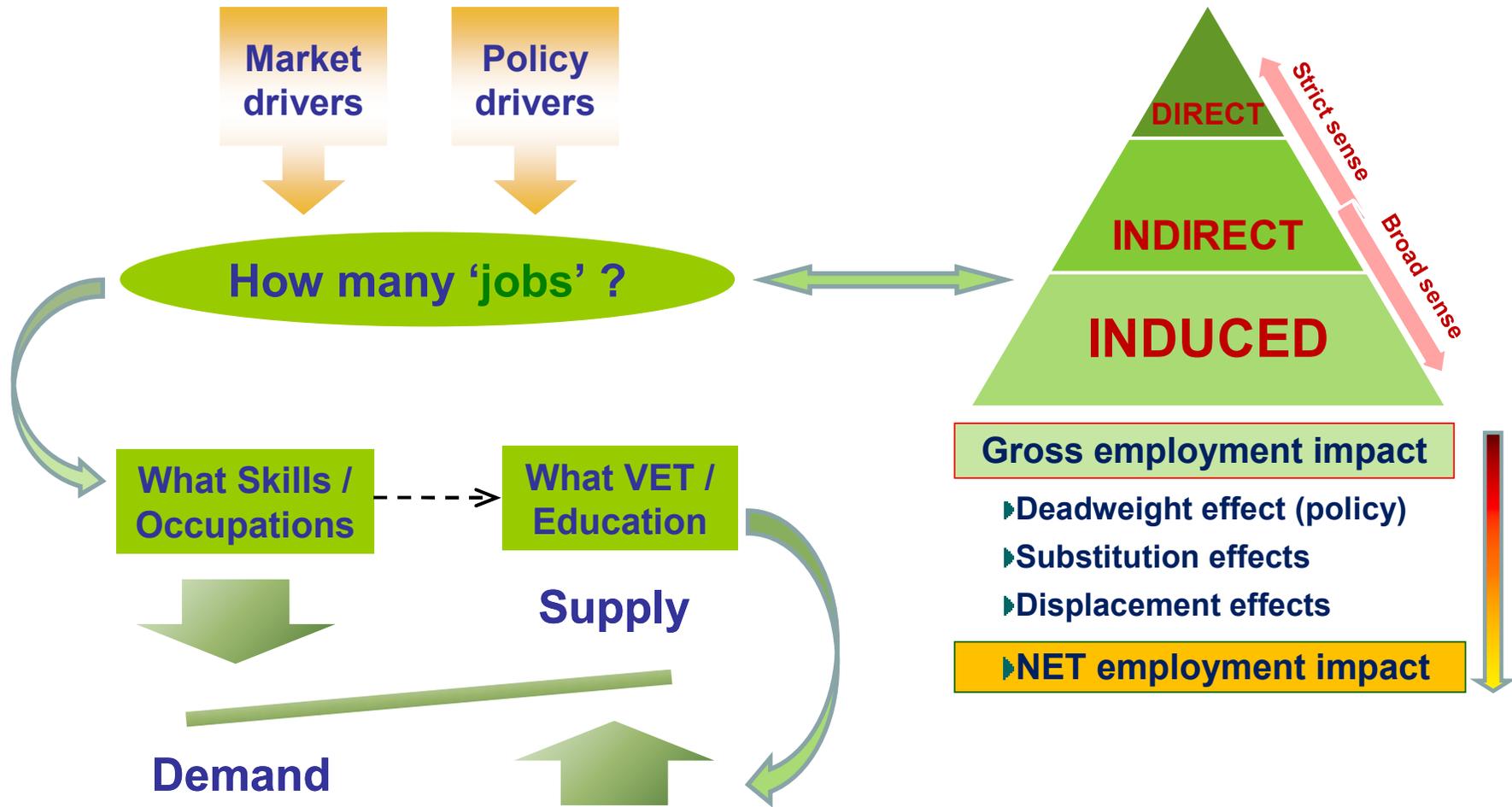
“Green” is not (exactly) a sector.

Identifying green skills – Cedefop's approach



“Green” is (also) a policy concept.

Identifying green skills – Cedefop's approach



Cedefop's main research projects

Skills for Green Jobs (Cedefop-ILO)

- Cedefop: Eight EU-MS (DK, EE, FR, DE, UK)
- ILO: 16 non-EU countries

Green Skills and Environmental Awareness in VET

- Nine occupations selected from various sectors and with different skill levels
- Eight EU Member States (GE, GR, IT, HU, N, SK, FI, UK)

Skills for a Low Carbon Europe

- Policy-driven scenario analysis for EU-27
- Policy case-studies national/regional level

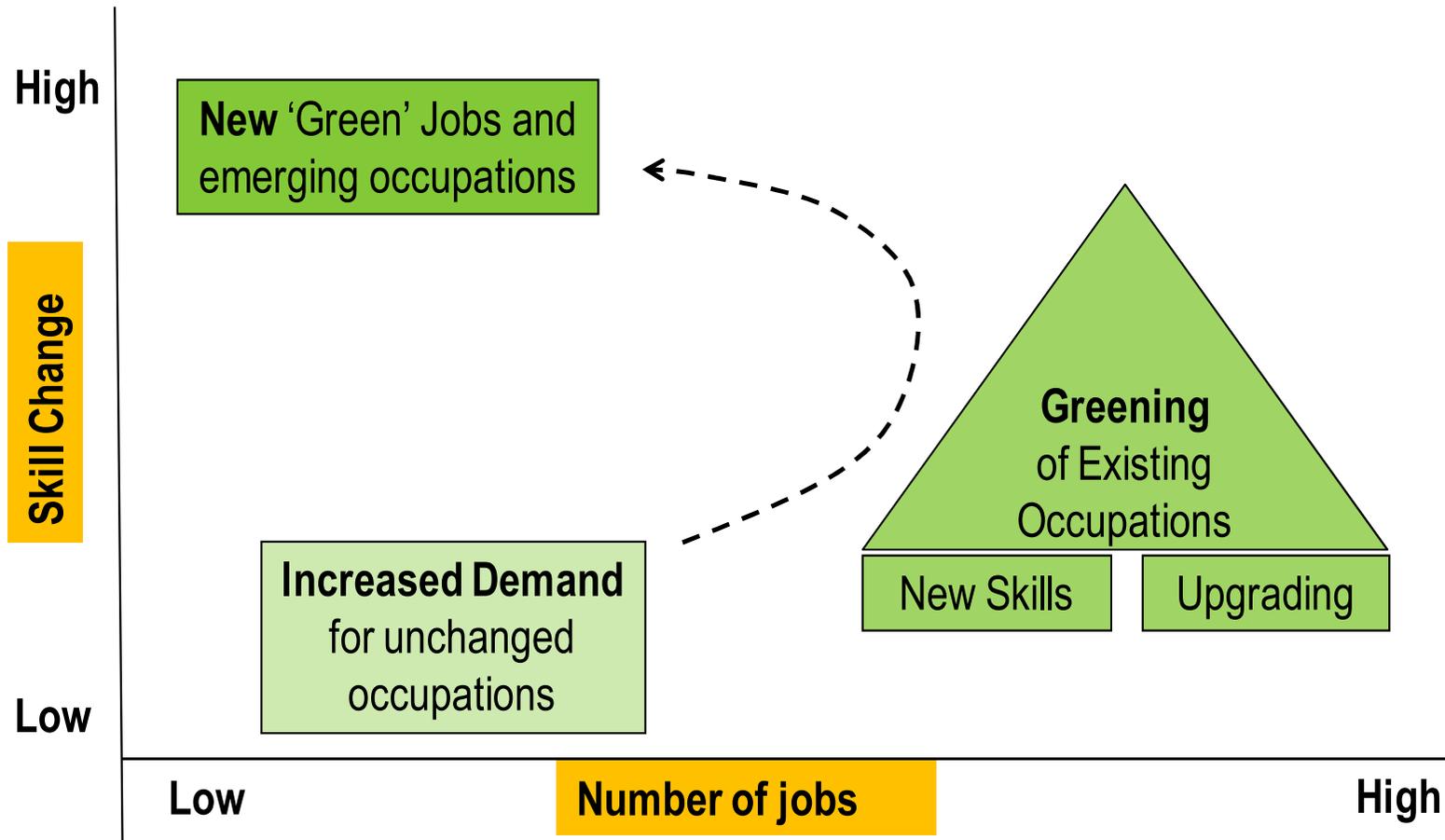
Main evidence from “Skills for green jobs”

- **Policy driven** growth → ‘Green’ stimulus packages are similar and **climate change** remains at the heart of environmental concerns
- Rise of ‘new occupations’, but effective **revision** and **upgrading** of existing workers’ skills are more important (GESO)
- **Integrating** skills responses in environmental policy is generally weak
- **Generic** skills are as important as **technical** skills;
- **Industry-specific** responses tend to be the most dynamic (reactive to market needs)
- Linking up industry with education and training, at **regional/local and sectoral level**, is likely to make a positive difference

Specific occupational-skill profiles to be investigated



Potential impact of green economy/policies on skills



Main evidence from “Green skills in VET”

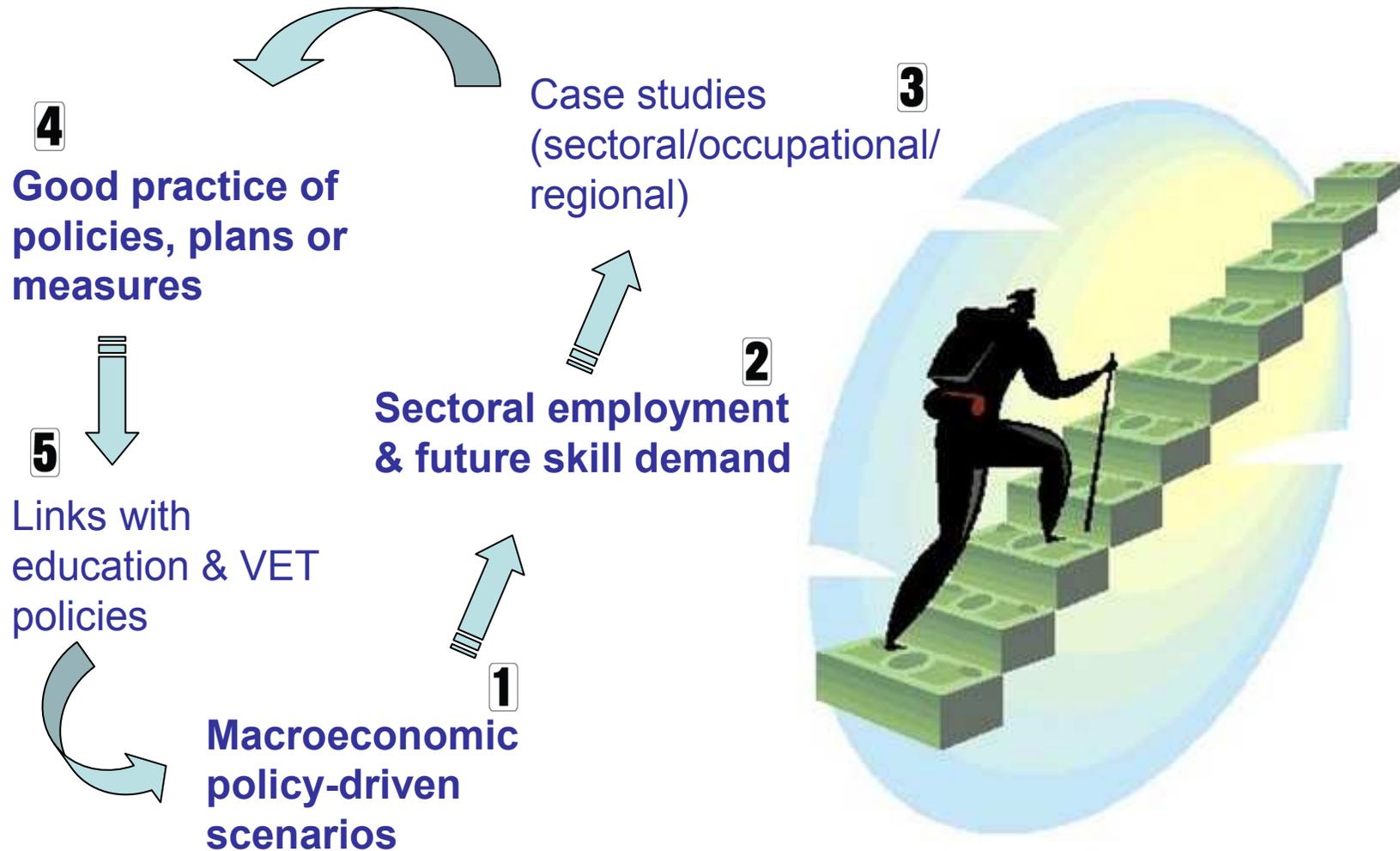
- Limited evidence of **skill shortages** due to the economic recession reducing demand, but some occupations are experiencing skill gaps mainly in practical and technical skills.
- **Uncertainty** about environmental regulations and policies makes it difficult to anticipate skill needs
- Multiple entry routes and **insufficient recognition** of skills acquired through non-formal or informal learning are important inhibitors to mobility of workers into green jobs.
- Younger workers in particular often perceive green jobs as low-qualified or ‘dirty’ (low **attractiveness?**).
- Learning providers are not sufficiently proactive, and are discouraged by **uncertain and diverse employer needs**.



Areas for improvement/further research

- **Data collection** (systematic statistics and ad-hoc surveys) on some of the emerging occupations requires improvement:
 - Improving Eurostat-ELFS
 - Ad-hoc surveys – e.g. occupational change at sectoral level to assess skills mismatch within tightly defined occupational boundaries.
- More research to improve and **reconcile macro- and micro-level** of analysis of skills needs for green economy
- Analyse **education and training systems responses** at national and regional/sectoral level – benchmarking analysis, case studies, good practices, etc.
- Analyse congruence between vocational evaluation, training, and job **placement** – e.g. outcomes/destinations of those qualifying to work in each STEM occupation; measures of entry into initial training/education for these occupations; etc.

New project “Skills for a low carbon Europe”



Thank you!

SKILL NEEDS IN SECTORS AND OCCUPATIONS

<http://www.cedefop.europa.eu/EN/about-cedefop/projects/identifying-skill-needs-in-sectors-and-enterprises/index.aspx>

GREEN SKILLS

<http://www.cedefop.europa.eu/EN/about-cedefop/projects/green-skills/index.aspx>

Antonio Ranieri

antonio.ranieri@cedefop.europa.eu



Skills for a Low Carbon Economy: **what next?**

***Skills for Green Jobs:
Gearing up education and training for green growth***

**Christine Hofmann
Skills and Employability Dept, ILO
hofmann@ilo.org**

Paris, 27 February 2012



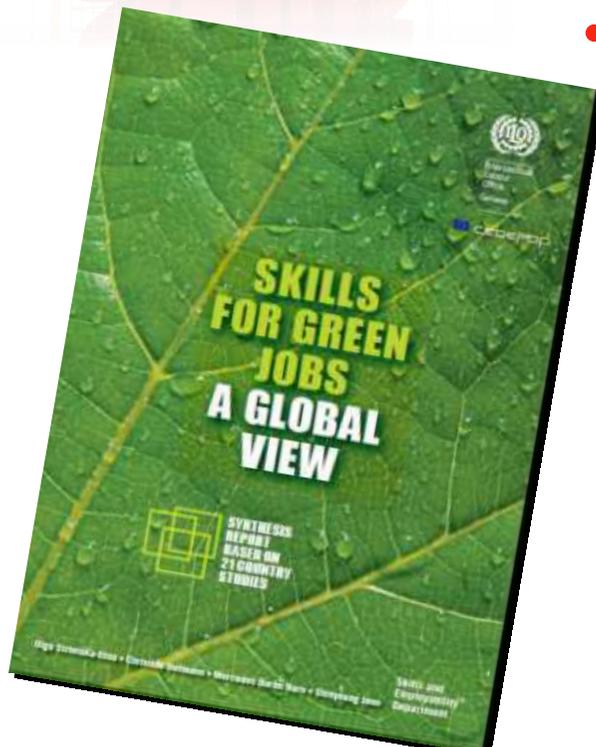
Skills for a Low Carbon Economy:
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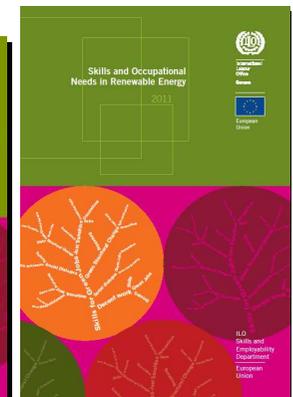
Environmental degradation impacts the world of work



- ... matter as they
- sustain job creation
- smooth transitions
- act as driver in their own right



**ILO-EC Project: Early identification
of skill needs for the low-carbon
economy**

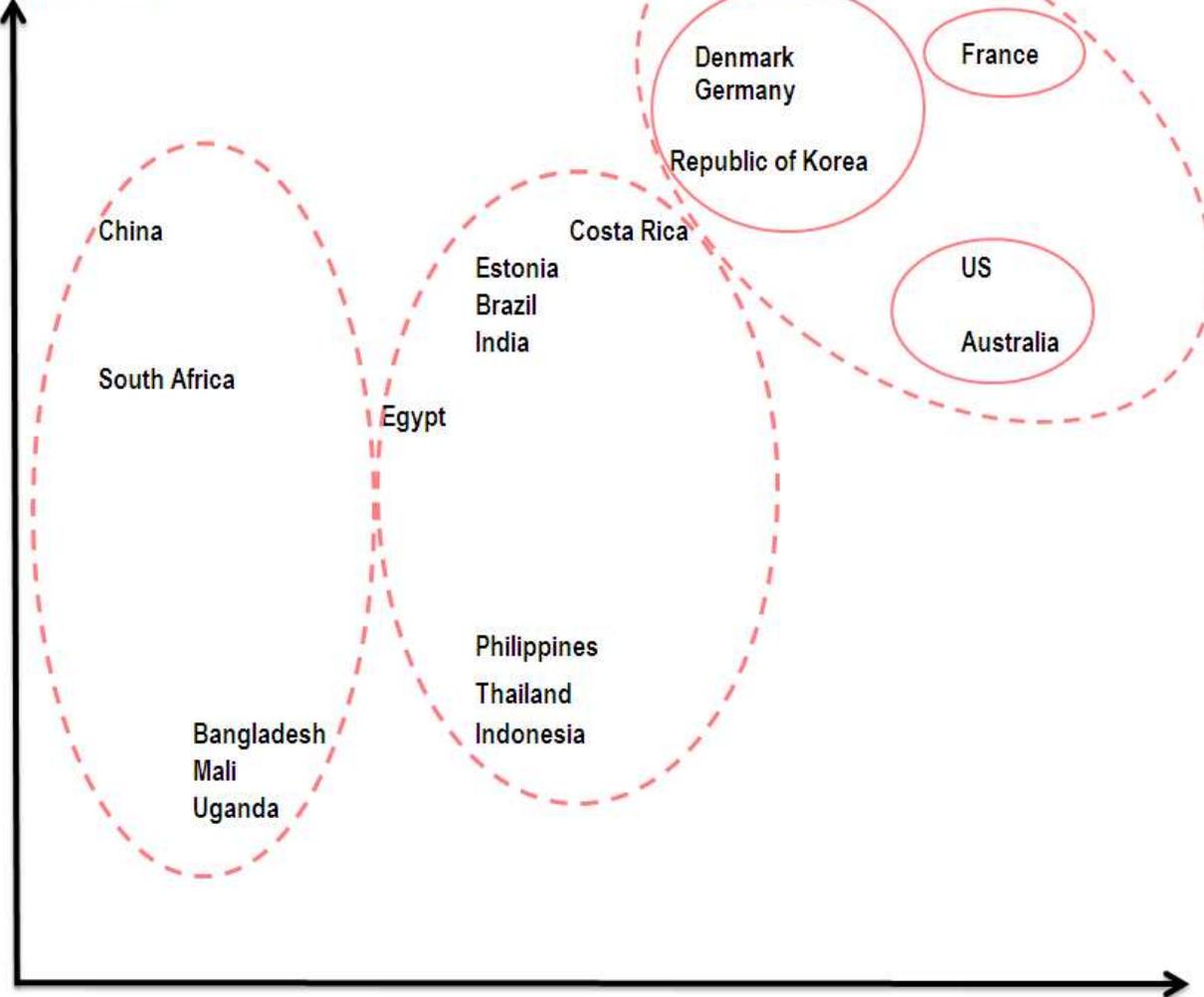


Why skills provision lags behind

- Rapid developments in environmental goods and services sector
- Multiple drivers: changing consumer demand, technology, innovation and environmental degradation
- Strong impact of environmental policy on skill needs
- **BUT: Weak coordination between skills and environmental policy!**

Coherence between skills and green policies

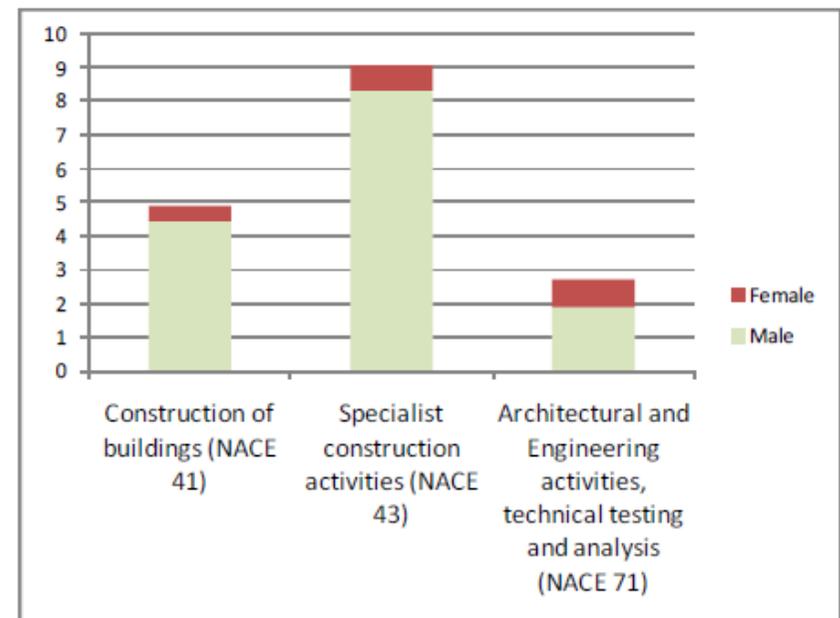
Sound environmental policies



Comprehensive skills policies for greening

Changes in existing occupations outnumber new ones

- Many changes relate to knowledge about regulation and new technologies, some to new markets and demand
- Emerging occupations more often require higher level qualifications
- Changes in existing occupations happen more often at the low and medium-skill level
- Gender dimension



Upgrade training provision – at all levels

Degree of skill change	Occupational change	Typical skills response	Examples
None	None or only quantitative	None or increased training in existing occupation	Bus driver in CNG driven buses; forester
Low	Changing occupation	On-the-job learning or short training courses	Welder in wind turbine production; Organic farmer
Medium	Changing or emerging occupation	Short courses or longer continuous training	Energy consultant in building; car mechanic for electric cars or CNG cars
High	Emerging occupation	Initial training, university degree or longer continuous training	Solar energy technician; eco-designer; biofuels technician

Target disadvantaged groups

- Those who will get green jobs are not necessarily those who will have lost their jobs
- Retraining matters!
- Make green jobs accessible for all by providing skills for disadvantaged groups such as youth, people with disabilities, low-skilled etc.
- Build on existing skills sets
- Include green concerns in existing labour market instruments



Focus on portable skills

- Strategic and leadership skills for policy-makers and business executives
- Adaptability and transferability skills,
- Willingness to learn about sustainable development;
- Co-ordination, management and business skills;
- Systems and risk analysis skills;
- Entrepreneurial skills;
- Innovation skills;
- Communication and marketing skills;
- Consulting skills to advise consumers;
- Networking, IT and language skills.



Include environmental awareness in all types of training

An effective skills response needs to ...

- Combine top-down and bottom-up approaches: sectoral, regional or local solutions often more effective

... be coordinated ...

- Inter-ministerial coordination, between training providers and enterprises or industry associations/ sector skills bodies

... identify skill needs and related training measures through social dialogue ...

- LMI systems need to adapt
- Sectoral approaches are much sought

... and go hand-in-hand with employment generation measures.



**Thank you
for your
attention**



The reports
are available at:

<http://www.ilo.org/skills/>

Skills for a Low Carbon Economy: **what next?**

Austrian 'Masterplan Human Resources in Renewable Energy Sources' (Masterplan HR RES)

Gerhard Geiger

3s research laboratory – geiger@3s.co.at

Paris, 27 February 2012



Overview

- ___ Masterplan: a tool for overcoming complexity in VET governance arrangements
- ___ Context: the interface between VET and labour market for a growing economy in the sector of RES in Austria
- ___ Masterplan HR RES: a multi methodological approach to ensure sufficient VET provision and employment to enhance Renewable Energies
- ___ Objectives of the Masterplan HR RES
- ___ Approaches and methods
 - ___ Scenario based skills forecast
 - ___ Screening VET provision
 - ___ Focus on special target groups: women, youth, migrants, older workers 50+
 - ___ Fostering permeability: Competence matrix 'eco energy technology' (VQTS) as an innovation in VET
- ___ Further considerations: policy recommendations of the Masterplan HR RES

Background

Employment in the sector of RES

- __ growing interest in ‚green growth‘ in almost all economic sectors in Austria
- __ Growing sector of RES technology in Austria (import + export)
- __ Lack of qualified workers for the growing green economy in general
- __ Competence deficits in generic and technical green skills in RES sector

Vocational education and training provision

- __ Renewal of VET provision: Complexity in VET governance arrangements
- __ VET provision for technical green skills: the ‚jungle‘
- __ ‚Education for Sustainable Development‘ (designed to strengthen generic Green Skills) recognised by politics, but not yet mainstreamed in VET

Masterplan HR RES

Reference to EU policy

- __ The Maastricht Communiqué (2004): to enhance the flexibility of VET systems to enable them to react more effectively and quickly to labour-market needs.
- __ The Bruges Communiqué (2010): to support VET-labour market cooperation – fostering social dialogue

Reference to national strategies and approaches

- __ Austria's government strives for energy-self-sufficiency and plans to base Austrian energy consumption entirely on RES by the year 2050
- __ The 'Masterplan Environmental Engineering' ('Masterplan Umwelttechnologie'): – focus on improving the Green Skills of workers, but not extensively referring to VET and employment in RES
- __ The 'Masterplan Green Jobs': sets a target of the creation of 100.000 jobs by 2020

Masterplans: topics to be discussed

- ___ Social scientists propose the development of a masterplan following comprehensive planning and co-ordination in different political fields
- ___ Characteristics of masterplans: what exactly do they serve for?
- ___ Motto: politicians go away – masterplans stay
- ___ Masterplans in the context of governance of VET sub-systems
- ___ ‘good’ governance: guiding principles
- ___ Problems of legitimacy

Objective of the Masterplan HR RES

The Masterplan HR RES shall be a tool that enhances co-operation and communication between the world of work (demand side) and the world of VET (supply side) to further develop Green Skills in the context of RES.



Targets of the Masterplan HR RES

- ___ to ensure human resources in the Austrian sector of Renewable Energies in the medium and long term which refers to all relevant technological fields (solar thermal energy, photovoltaic, wind energy, biomass energy, etc.);
- ___ using a participatory approach – fostering social dialogue;
- ___ to serve as a basis for decision-making on education and labour market policy in the form of scenario-based recommendations;
- ___ Involvement of decision makers from these political fields;
- ___ to assist educational organizations and VET providers in shaping efficient educational offers within the existing education system (in the sense of transitions, permeabilities and credit transfers);

Approaches and methods

Scenario based skills forecast

___ Quantitative labour market demand:

to develop three different, but internally consistent, human resources scenarios for the quantitative development of each renewable energy source - based on the analysis of existing strategies, master plans and road maps, own calculations, on expert workshops, on a company online survey;

___ Qualitative education and training needs:

to identify the necessary content of initial and continuous education and training programmes today and in future (broken down by sector and qualification level);

Approaches and methods

Screening of VET provision

to achieve a comprehensive overview on initial and continuous education and training on offer for the renewable energy sector (on the basis of curricula, examination tasks etc., but also on the basis of existing studies)

Approaches and methods

Focus on special target groups: women, youth, migrants, older workers 50+

to articulate recommendations on measures likely to mobilise those groups so far underemployed in the field of renewable energy technology;

The leading question is:

‘Which groups would be suitable to pursue an educational and vocational pathway in the field of renewable energy and how many workers could be gained through this?’

Given the strong gender imbalance in the technical and scientific disciplines, observance of the gender dimension is central.

Approaches and methods

Recognition of learning outcomes

to define the core elements for the mutual recognition of learning outcomes, and to develop propositions to improve the permeability of VET.

___ Definition of qualification contents (competences) that are conveyed through different education and training offers and that can be used for mutual recognition

___ Development of a competence matrix for the specific occupational field 'eco-energy technology'

Competence Matrix (VQTS)

Competence areas

Competence area	Steps of competence development				
Maintaining and assuring the reliability of mechatronic systems	He/She can perform the basic scheduled maintenance on mechatronic machines and systems and adhere to the preventive maintenance plans.	He/She can master the maintenance procedures for mechatronic systems such as the use of service documents and maintenance plans and, if faced with new challenges, can make the necessary adaptations.	He/She can use preventive maintenance to assure the trouble-free operation of mechatronic systems. In addition, he/she can modify operational sequences to implement quality-assurance measures.	He/She can develop the necessary procedures for maintenance of mechatronic devices and systems, and can schedule the maintenance and quality-assurance procedures.	
Installing and dismantling mechatronic systems and facilities	He/She can use written instructions to install and dismantle individual components (sensors, actuators, drives, etc.) and assemble them for a functional group of mechatronic systems.	He/She can master the installation and dismantling of mechatronic systems that use several technologies (mechanics, hydraulic, pneumatic, electrical-mechanics, electronics), set up the connexion technology, and check the efficiency of the overall system.	He/She can provide independent mechatronic solutions for the construction of production lines, assure their overall ability to function, and, in addition, can use both existing and modified standard components.		
Installing and adjusting mechatronic components in systems and production lines	He/She is able to install and adjust standardized mechatronic components, e.g. individual electro-pneumatic valves, sensors and actuator units.	He/She can install and adjust components of mechatronic subsystems (e.g., linear drives, measuring systems, transport systems).	He/She can install and adjust complex mechatronic facilities that include diverse technologies and instrumentation and control (I & C) equipment, adjust the associated parameters, test the facilities overall functions, and assure their reliability.		
Designing, adapting, and building mechatronic systems and facilities on the basis of client needs and site plans	He/She can use the tools controlled either manually or via computer program to fabricate (according to specific production designs and customer requirements) the individual components of mechatronic systems. He/She can provide simple designs and descriptions of mechatronic systems, and use basic CAD applications.	He/She can build simple mechatronic subsystems by using engineering drawing techniques and can install the devices according to specific production needs. He/She can act on an extensive knowledge of standards and regulations (e.g. on surface treatments) and is able to use CAD's more advanced functions (e.g. interference check).	He/She can build and build autonomous mechatronic subsystems and, with suitable measuring and testing facilities, can assess the necessary production accuracy. He/She can document the results with quality-control systems.	He/She can make independent adaptations to the various devices (including selection of drives, sensors, SPS) and can use CNC programs for building the systems. He/She can, through a digital mock up, assemble and simulate the functioning system and use computer-aided computations (e.g. FEM). He/She can perform cost-benefit analyses (e.g. as a basis for deciding whether components should be bought or individually constructed).	He/She can independently develop complex mechatronic systems and can calculate the economic usefulness of the system. He/She can optimise CNC programs for the manufacturing of complex mechatronic devices and systems and monitor the automated quantity of an open loop control system.
Putting mechatronic systems into operation and providing clients with technical and economic support	He/She can, according to specifications, put mechatronic devices into operation and provide support to the client in the hand-over phase.	He/She, after considering the enterprise's needs and basic conditions, can put the mechatronic systems into operation, create the necessary documentation, advise the customer on safe operations of the devices, and advise on future technology selection.	He/She, after considering all basic conditions, can master the start-up of interconnected mechatronic systems and machines, and can provide the necessary documentation including a manual. He/She can review client needs and configure machines that provide solutions. He/She can train the customer where necessary and provide support for safe operating procedures.	He/She can evaluate customer requirements for mechatronic facilities, develop solutions, and can plan the system's implementation and operation.	He/She can direct, including scheduling and time management, the start-up of the project from the creation of a proposal to the client's acceptance.
Supervising and evaluating both the process sequences of mechatronic systems and facilities and the operational sequence (including quality assurance)	He/She can supervise process sequences according to specifications and implement any requested quality-control measures.	He/She can independently supervise the process sequences, evaluate the results, operate an accompanying statistic process control (SPC) for the quality control plan, and prepare simple work schedules, including production schedule and time management.	He/She can operate and supervise mechatronic facilities, choose testing and monitoring plans, set up an accompanying SPC, seek the optimal results of the production line according to material-flow, and provide work schedules including standard production times.	He/She can master the monitoring of complex mechatronic systems using virtual instruments and PPS systems as well as adjust the control for the optimisation of machinery arrangement, material-flow analysis, and scheduling.	He/She can optimise the process cycles of mechatronic production lines, provide instructions on modifying the PPS systems (e.g. adjustment to S&P systems) and introduce quality systems for continuous improvement processes (CI/IKVP).
Installing, configuring, programming and testing hardware and software components for control and regulation of mechatronic systems and facilities	He/She is able to install and configure programs for hardware and software components as well as set up simple software control programs (SPS).	He/She can master the selection of hardware and software for mechatronic systems (sensor, actuators, interfaces, communication procedures) and can provide and test simple software control programs (SPS) according to production process requirements.	He/She can integrate and configure program-, control- and regulation-mechanisms in mechatronic systems, program simple devices (in co-operation with developers), and simulate the program sequence before start-up.	He/She can develop, test, and configure hardware and software solutions for networked mechatronic systems, and can monitor system conditions with suitable measuring and visualisation tools.	
Preparing and distributing the technical information for adjustment of each enterprise's mechatronic systems	He/She can provide descriptions and steps of mechatronic subsystems as well as be familiar with the basic CAD applications.	He/She can fully understand the management of technical information documents for mechatronic systems and can prepare and adapt these documents according to an enterprise's specific operating requirements.	He/She is able to analyse complex operational sequences separately in order to understand the connections and draw up maintenance and production procedures. He/She can understand that the system parameters are important for the equipment's functions and can independently assess and document the wear and general conditions of the mechatronic equipment.		
Diagnosing and repairing malfunctions with mechatronic systems and facilities, advising clients on avoiding malfunctions, and modifying and expanding mechatronic systems	He/She can diagnose and repair errors and malfunctions on the mechatronic systems. He/She can use the necessary checking, measuring, and diagnostic tools.	He/She can independently correct problems in mechatronic production equipment with the help of (computer-aided) diagnostic systems and the use of expert systems, databases, and error documentations.	He/She can diagnose and repair errors and disturbances in complex mechatronic equipment and is able to advise clients on how to avoid sources of malfunctions through changes or upgrades in the equipment and system.	He/She can develop, through analyses of malfunctions in the mechatronic equipment, a monitoring and diagnostic system.	

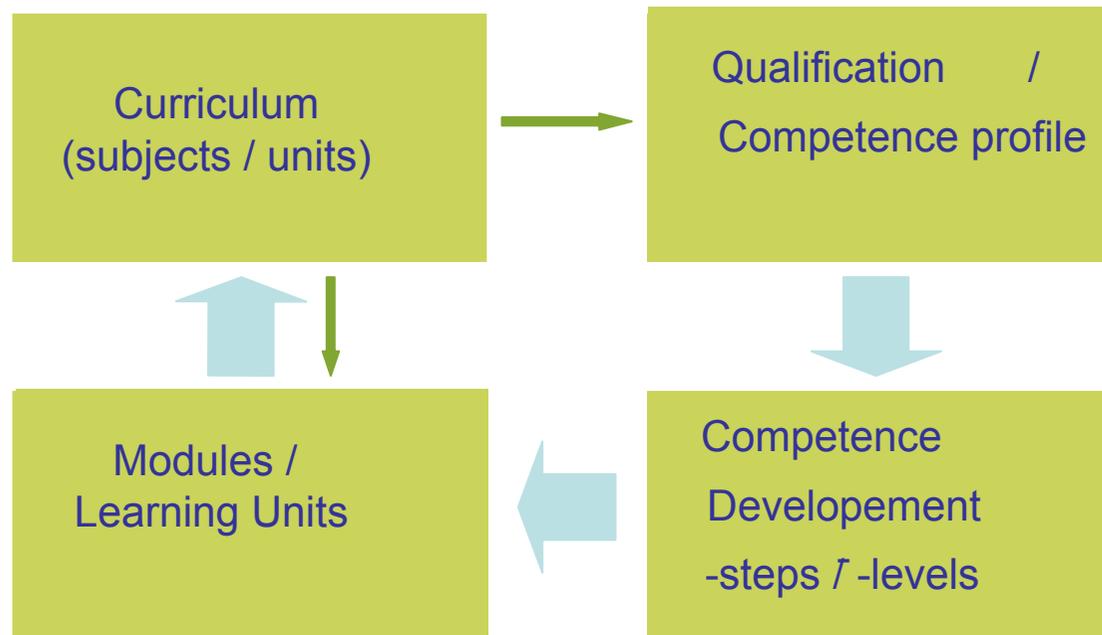
Scope:
Skilled workers
in the field of
Mechatronics, IVET

Steps of
competence
development
2-6 steps

Source:
<http://www.vocationalqualification.net/vqts/>



Using the VQTS model for curriculum development and design...



Demand oriented / modern curriculum design



Supply oriented / traditional curriculum design

Source: own description

Themes for further research

More theoretical considerations

- ___ Analysis of the Masterplan HR RES as a new governance tool in the context of the political economy of skill formation

Practical perspective

- ___ How does renewal of VET provision work?: Feedback loops in different organisational fields in the sector of RES (‘Feedback loops’ as a research focus of an ongoing Cedefop study; 3s as consortium lead)
- ___ Monitoring of the implementation of the Masterplan HR RES
- ___ Maintreaming ‘Education for Sustainable Development’ in VET in Austria

Further information

Project consortium



Project funded by



Online

www.masterplan-energie2020.at



**Skills for a Low Carbon Economy:
what next?**
27 FEB. 2012 | PARIS, FRANCE





Skills for a Low Carbon Economy:
what next?
27 FEB. 2012 | PARIS, FRANCE



Global Green Skills Training Action Plan

Authors: Joel Marsden, James Medhurst and Pat Irving;
GHK Consulting

Agenda



Skills for a Low Carbon Economy:
what next?
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- **Overview of our approach**
- **Outlining the challenges**
- **Building the action plan**
- **Policy recommendations**

G | H | K

Agenda

Approach

Challenges

Action Plan

Conclusions

The EU agenda for new skills and jobs and the G20 global training strategy provide the framework

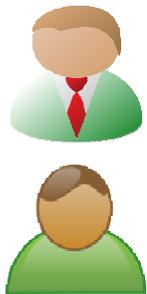
- A. Better functioning labour markets
- B. More skilled workforce
- C. Better quality jobs and working conditions
- D. Stronger policies to promote job creation and demand for labour.



1. Quality education as a foundation for future training
2. Continuous workplace training and Lifelong Learning
3. Building bridges between the world of work and training providers
4. Anticipating and building competences for future needs
5. Ensuring broad access to training opportunities



Successful skills strategies require demand and supply side actions

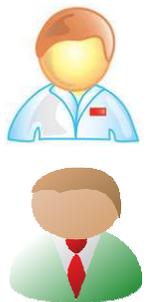


Demand side

- Stronger policies to promote job creation and demand for labour
- Anticipating and building competences for future needs

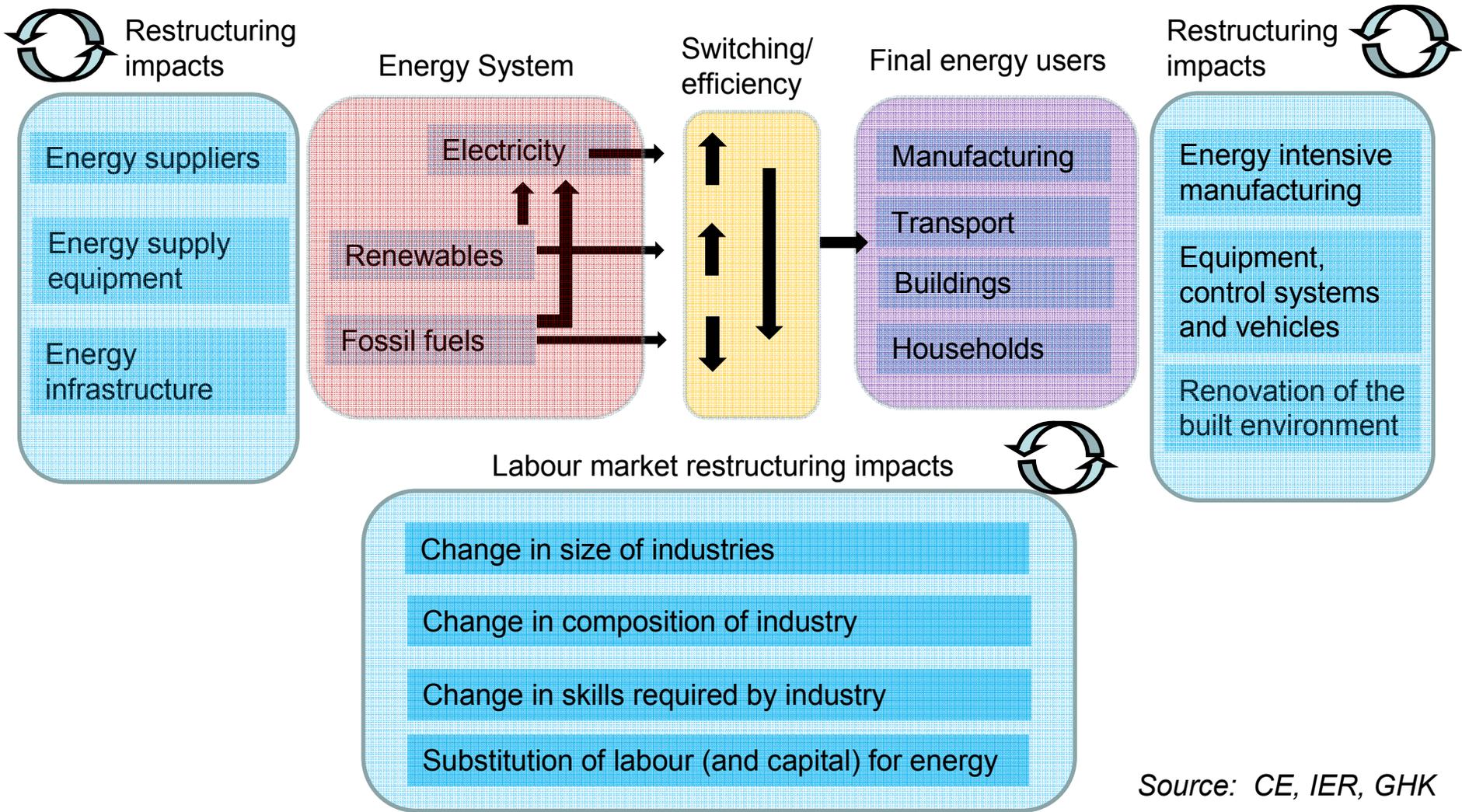
Building bridges between the world of work and education and training providers

Supply side



- Quality education as a foundation for future training
- Continuous workplace training and lifelong learning
- Ensuring broad access to training opportunities

Green transitions: a special case - technical change, characterised by churn



Source: CE, IER, GHK

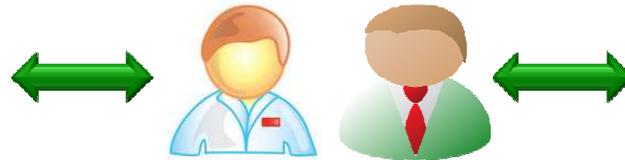
Lifelong learning: reacts to and drives green skills training

Challenges

Solutions

Foundations for future training

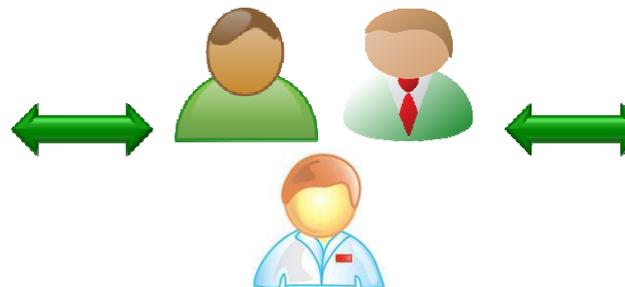
- Willingness to learn
- Ability to learn



- Active learning
- Mainstreaming

Continuous workplace training and lifelong learning

- Restructuring
- Internal adjustment



- Intensive retraining
- Flexible upskilling

Deeper, broader and flexible tripartite cooperation and engagement is fundamental to successful transitions

Employers and employees



Education and training providers



Government and local authorities



Building bridges between the world of work & education and training providers

Challenges

- Rapid change
- Skill bottlenecks

Solutions

- Managed networks
- Policy coordination

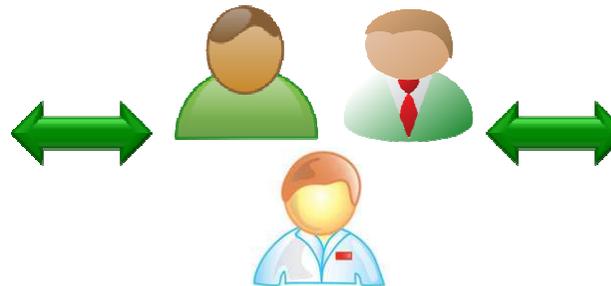
The need for an evidence base on the long-term and distributional impacts of change

Challenges

Solutions

Early identification of skill needs

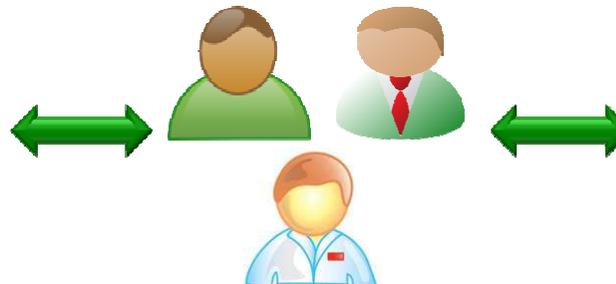
- Mixed messages
- Winners & losers



- Foresight research
- Adjustment support

Broad access to training

- Reinforced trends
- Unregulated activities



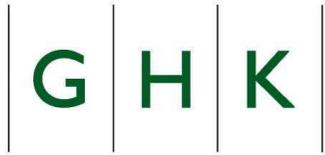
- Targeted support
- Decent jobs

Policy Recommendations: a recap

- Active, hands-on learning
- Mainstream environmental awareness
- Intensive courses to retrain
- Flexible courses to upskill
- Managed networks and policy coordination
- Foresight research into patterns of demand and supply
- Targeted support at vulnerable sectors and groups
- Ensure green jobs are also decent

Points for discussion / themes for further research

- Speed of implementation of effective policy action to support transition and drive demand for new skills (and time for developing training responses)
- Importance of overlooked skills in relation to entrepreneurship and innovation to ensure business responses to a changing policy environment
- Education and training's dual purpose; jobs and growth above all else?
- LT benefits of education (e.g. for lock-in); training for effective ST responses
- Integrate green skills analysis into the mainstream – how far to go? (e.g. if the EU cannot address general shortage of STEM how can green sectors?)
- Scope for applying analysis to other dynamics and 'mega-trends'
- Opening up green skill niches - looking beyond energy and climate



Skills for a Low Carbon Economy:
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Thank you for listening

For more information please contact:
joel.marsden@ghkint.com

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Completed studies	Clients
Skills for green jobs	Cedefop / ILO
Assessing green jobs potential in developing countries	International Labor Organisation
The employment dimension of economy greening	European Employment Observatory
Impact of climate change on employment and skills in the short term	DG Employment and Social Affairs
Implications for policies supporting transition to a Green Economy	DG Environment
Forthcoming studies	Clients
Skills for a low carbon Europe: the role of vocational education and training in a sustainable energy scenario	Cedefop
Studies on sustainability issues: Green jobs; trade and labour	DG Employment and Social Affairs
Benefits of achieving the EU biodiversity targets in the labour market and shortcomings in workforce skills	DG Environment
Background paper on VET excellence and green growth	DG Education and Culture

Skills for a Low Carbon Economy: **what next?**

Skills for Disruptive Innovation

Ray Pinto

BIAC : Microsoft
rpinto@microsoft.com

Paris, 27 February 2012



Challenges...

“Over half of Europeans (250 million) go online every day but 150 million Europeans – some 30% - have never used the internet.”

EU Digital Agenda, May 2010

“Europe is suffering from a growing professional ICT skills shortage and could lack the competent practitioners to fill as many as 700,000 IT jobs by 2015”

Commissioner Neelie Kroes, May 2010

As the EU moves towards a knowledge-based economy, jobs requiring a high level of education will rise from 25% to 31% (EU Commission forecasts)

“Within 5 years 90 per cent of jobs will require ICT skills, across all sectors, making skills, training and education in ICT a critical priority for employment and job prospects”

IDC Report - Post Crisis: e-Skills are Needed to Drive Europe's Innovation Society. Dec 2009

23 million unemployed in EU 27. Youth Employment stands at 21%. In Spain this exceeds 40%! Eurostat

Challenges...

EU of the 32m students male to female is roughly 50-50. But women in STEM studies are:

- *19% Engineering*
- *24% Computing*
- *35% Architecture / Building*

Source: DG EAC / Eurostat

Women account for over 50% of the student population and obtain 43% of PhD-level degrees, but on average they only obtain 15% of senior academic positions

Source: SheFigures 2006 study

Innovative education

Microsoft Partners In Learning – helping educators connect & collaborate; Employing technology throughout learning process.

- **Programmes: Partners in Learning – currently impacts 192 teachers and students at more than 2,000 schools in 114 countries**
- **Microsoft is committed to education with more than 800 employees around the world focused on education and the Partners in Learning initiative reaching, 300,000 institutions in 114 countries**
- **2006 through the launch of the European Alliance on Skills for Employability to provide access to technology and skills training for 20 million Europeans.**

DigiGirlz Day

- **A one-day event designed by Microsoft to provide high school girls with a better understanding of what a career in technology is all about.**
- **During the event, students interact with Microsoft employees and managers and guest speakers to gain exposure to careers in business and technology and to get an inside look at what it's like to work at Microsoft. This event provides girls with career planning assistance, information about technology and business roles, thought-provoking exercises, and interesting Microsoft product demonstrations. By participating in the Microsoft DigiGirlz Day, young women can find out about the variety of opportunities available in the high-tech industry and can explore future career paths. On-line DigiGirlz courses are as well available.**
- **In 2011, there were over 5,100 participants involved in the program**

Connecting New Skills with New Opportunities



Students to Business (S2B)

Connecting students to industry using an **online job matching tool**.

www.microsoft.com/studentstobusiness

More than 300,000 students globally have been connected with new career skills, leading to 15,000 students with jobs and internships in **13 countries across the EU**.

- **Imagine Cup**

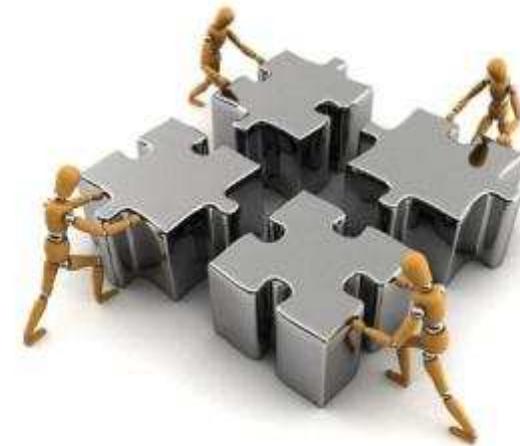
'The World Cup of Technology' that orientates youth to address big sustainability challenges by using **new technologies combined with entrepreneurial ideas**.

www.imaginecup.com

E.g Mobile healthcare apps for the partially sighted



Microsoft



Thank You



Skills for a Low Carbon Economy: **what next?**

GT VET Greening Technical VET – Sustainable Training Module for the European Steel Industry

Antonius Schröder
sfs – Technische Universität Dortmund
schroeder@sfs-dortmund.de

Paris, 27 February 2012



Skills for a Low Carbon Economy:
what next?
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GT VET Objectives

- identify and anticipate **impacts of environmental legislation in everyday work** of skilled workers, both for today and future;
- timely and responsive **implementation of new mandatory skills** within VET systems (national and industry related);
- **match demands of industry with the VET system**, obtaining European learning outcomes on green skills and sustainable awareness within technical VET;
- investigate the scope for the development of **ongoing and responsive training pathways**;
- develop a model of an **industry driven and run European sustainable training module**, focusing on skills for environmental sustainability;
- **adapt and test the module** within four steel companies and member states (United Kingdom, Poland, Italy and Germany);
- use the example of the steel industry and the VET of mechanical and electrical technicians for adaptation and **transfer to other technical professions and production industries**;
- produce a **blueprint for the implementation** (process) of new skills for the industry sector and appropriate VET systems.



Partnership: Steel Companies and Research Institutes

- Germany:**
 sfs – TU Dortmund (Coordinator)
 ThyssenKruppSteel Europe AG, Duisburg
- Poland:**
 Instytut Metalurgii Żelaza IMZ, Gliwice
 ArcelorMittal Poland S.A., Dabrowa Górnicza
- Italy:**
 Istituto per la Cultura e la Storia d'Impresa ICSIM, Terni
 ThyssenKrupp Acciai Speciali Terni AST, Terni
- UK/Wales:**
 Cardiff School of Social Sciences, Cardiff University
 Tata Steel UK, Port Talbot
- Strategic Partners (Dissemination and Valorisation):**
 European Steel Association EUROFER, Brussels
 European Metalworkers' Federation EMF, Brussels
- External Evaluation:**
 VFA – Development and Innovation Consultants, Athens
 Jean-Claude Charbonnier (Consultant)

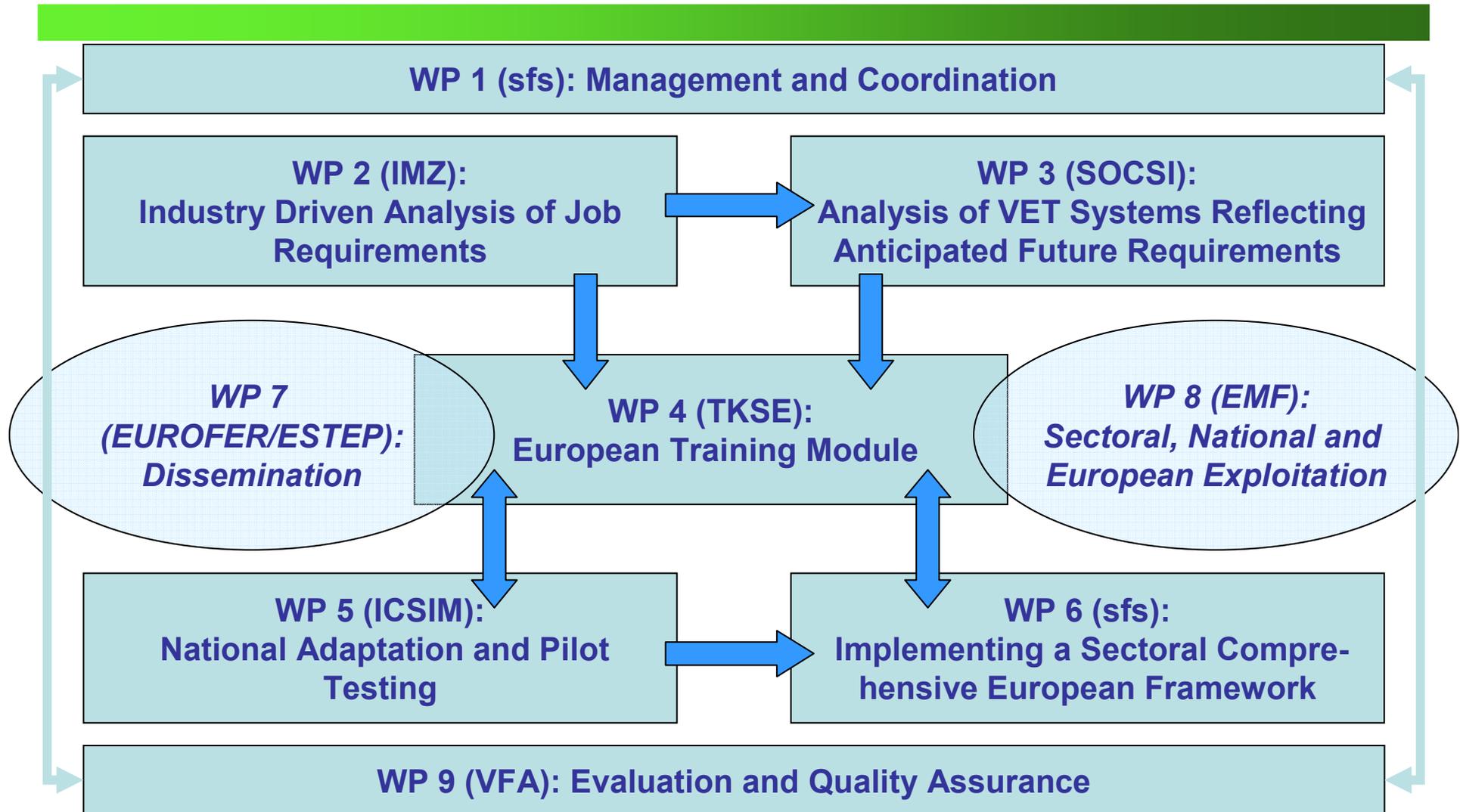


Relevance of GT VET

- In line with **basic European strategies**: lifelong learning, new skills for new jobs, EU 2020 strategy, Lisbon strategy;
- And **EU environmental directives** (IPPC, GHS, REACH, ...), national and company guidelines and recommendations;
- Improving the **European and national VET-system** by short term and industry driven pathways between industry demands and national VET systems;
- And in line with actual steel **industry requirements**: recruitment and training



Consecutive Work Plan



Industry Driven Job Requirements (I)

1. Environmental (and related health and safety) **legislation** and company implementation:
 - Knowledge centre for environmental issues in all major steel companies
 - European contact point / bureau, environmental networking in Brussels
 - “Translation” of legal requirements into procedural instructions, handbooks
 - Good practice examples for “application-oriented diffusion” can be identified → every employee has to understand the message
 - Strict corporate targets (“no accidents”) exceeding legal requirements to some extent → from complying to improving
 - Steering approach through highly diversified target figures on company / department / plant level
 - High influence of instructions on everyday work

Industry Driven Job Requirements (II)

2. Responsibility for environmental (and related health and safety) issues:

- Distinct departments for environmental issues and occupational health and safety
- Hybrid working groups meet and define implementation pathways
 - to comply with new legal directives
 - to integrate new requirements into training (VET, further training)
- Differences in autonomy of plants
 - E.g.: TKSE plants have recently installed their own environmental representative
- “Culture” of shared responsibility
 - Skilled workers are more and more considered as responsible for “green performance”

Industry Driven Job Requirements (III)

3. Environmental/green aspects of **skilled work** within the plant (electrical and mechanical Technicians):
- Environmental regulations influence basically every maintenance routine
 - Extensively integrated in
 - VET and further training
 - Plant protocols / operational instructions
 - Additional “green projects” to improve environmental performance
 - Training more and more resembles everyday work (integrative learning approach, autonomous problem solving and reflection as pedagogic concepts gaining importance)



Curricula and Green Skills Reference

- A varied set of policies and practices (curricula) exist leading to different levels of competence, skills and knowledge across the case study countries
- Main challenges:
 - changing (environmental) workplace cultures – driven by efficiency imperatives → improving actions, saving Money
 - sections and managers determine levels of relevance
 - ‘trickle down’ of wider policy goals



European Training Module (I)

Develop action-oriented green skills projects

- First definition of **European standards** concerning green skills/awareness in technical professions
- **Green contents:** energy; resources; waste; pollution; lifecycle assessment (use and disposal of hazardous substances seem to be covered enough in current learning processes)
- **Learning goals:**
 - Strong emphasis on strengthening green awareness
 - Learning outcomes must be tangible
 - If feasible, combining cognitive learning and manual learning
 - Create useful work pieces which foster sustainable learning

European Training Module (II)

- **Green skills** for technical VET in the European steel industry:
 - technical skills and appropriate awareness for environmentally sustainable behaviour
 - to prevent and reduce negative impacts on the individual and environment (neighbourhood, employees, air, water and ground)
 - caused or initiated by operations and work in and around steel production.
- **Knowledge, abilities and attitudes:**
 - to save and reduce input of resources, particularly energy and raw materials.
 - to prevent and reduce emissions, pollution and noise.
 - to utilize, store and dispose of waste materials in a manner that conforms with best practice environmental procedures and understands the consequences of nonconformity.
 - to understand the value, impact and lifecycle of resources and materials.
 - to keep track of current standards and best available techniques.



Matrix: Learning Fields / Knowledge Levels

	Basic knowledge	Understanding of backgrounds and contexts	Process oriented expertise	Experience based competences
Energy reduction				
Emission prevention and reduction				
Handling, storage, removal of waste				
Value and lifecycle of materials and resources				
Actual standards and available best techniques, technologies				

**Cases,
concrete contents,
projects etc.**

**from a workplace perspective,
from everyday work**

**(considering related
didactical aspects)**

Policy Requirements

- **Flexible ways and leeway to include** industry driven **modules** of VET
- **Overarching European wide learning objectives** based on an industry related **European definition of green skills**
- ECVET as a **European wide and accepted certification** of the training modules
- **Cooperation and involvement** of companies and vocational schools **at the regional level**, where people live, work and learn
- “Traditional” production industries should be considered in **European advanced manufacturing** activities much more





Thank you!

<http://www.gt-vet.com>

www.sfs-dortmund.de



**Skills for a Low Carbon Economy:
what next?**
27 FEB. 2012 | PARIS, FRANCE



By Antonius Schröder

The contribution will refer to the first results of a European Lifelong Learning Programme funded project Greening Technical-Vocational Education and Training (GT VET). Within this project short termed vocational education and training (VET) pathways are explored to meet environmental and corresponding health and safety skill needs of the steel industry. As a model, the project will develop an industry driven European sustainable training module in correspondence with national VET systems. A partnership of steel companies (ThyssenKruppSteel Europe, ThyssenKrupp AST, Tata Steel, ArcelorMittal) and research institutes, from four member states, aims to identify and anticipate the impacts of environmental legislation on the everyday work of mechanical/industrial technicians and electrical technicians (for today and the future). Independent of the different VET systems of the member states, VET practices and learning outcomes need to be evaluated with respect to environmental skills, expertise and awareness. Based on these insights a European training module will be developed to obtain identical European learning outcomes in the field of green skills and sustainable awareness (for example, focusing on preventing pollution and securing occupational health and safety) complementing current technical VET programmes in this area. The module will be tested within four steel companies and member states (United Kingdom, Poland, Italy and Germany). Adjustments for each national system of VET will be made and learning outcomes will be evaluated with transferable credit points (ECVET).

Using the example of the steel industry and the VET of industrial, mechanical, electrical and electronic technicians, the modules and process of implementation might possibly be developed for adaptation and transfer to other technical VET professions and production industries. The aim is for the module and the tested implementation processes to become a blueprint for the updating and implementation of training for new skills into the VET system, which are focused on meeting industry driven requirements for environmental sustainability in an immediate and responsive way.

Beneath the conception of the project first results of industry driven job requirements on green skills for technicians and its reflection in the VET system (Germany, Italy, Poland and UK) will be presented as well as a first concept for the training module.

Skills for a Low Carbon Economy: **what next?**

**Anticipating and managing the effects of
greening of industries in the EU:
Skills development in the overall context
of job quality**

Simonas Gaušas (PPMI) and dr. Radosław Owczarzak (Eurofound)

Paris, 27 February 2012



- **Introduction to the study**
- **Examples of anticipation of greening effects**
- **Examples of management of greening effects**
- **Link between green change and cultural change**
- **Role of public authorities**
- **Implications for further research**

Introduction to the study

- Eurofound study “Growth and employment: anticipating and managing the effects of greening of industries in the EU”
- To be launched on 2nd quarter of 2012
- Focus on:
 - EU27 + Norway
 - Climate change mitigation (causes) and not adaptation (consequences)
 - Job quality: not only on skills development, but also career and employment security, health and work-life balance
 - Case studies (42 so far incl. 12 on SMEs) in 10 target sectors
 - Direct effects on jobs (effects on supply chains not analysed)

Examples of anticipation of greening effects

- **Mostly autonomous and mostly for skills development**
- **Usually short-term (up to few years) and based on estimated business development trends**
- **Other approaches include:**
 - Specific strategies (e.g. focusing on skills which are the most difficult to replace and have the largest strategic influence)
 - Active role of separate departments (e.g. product development)
 - Cooperation with associations (esp. SMEs), universities, trade unions
 - Organic development based on reciprocity and flexibility

Autonomous management of greening effects: Examples in skills development

- **Majority of analysed companies managed skills**
- **Most widespread:** internal (esp. on-the-job) training, selective and specific for senior and environmental staff; general for non-technical and blue-collar staff; introductory for new employees; based on education plans
- **Less widespread:** training abroad, information sessions, guidelines/ info packs, training leave
- **Unconventional approaches:** own universities, skills matrixes, IT solutions (e.g. telematic monitoring systems)

Collaborative management of greening effects: Examples in skills development

- **Majority of those who managed also cooperated with partners**
- **Partners include:** vocational schools, universities, employment agencies, private education providers, suppliers, business partners, consultants, trade unions, associations and networks
- **If possible SMEs rely on external resources; those in newer EU MS seek specific skills (e.g. in renewables) abroad**
- **Unconventional approaches:** summer internships for children of workers, separate climate change research units in universities, joint plans to secure the career path with public authorities, Knowledge Transfer Partnerships

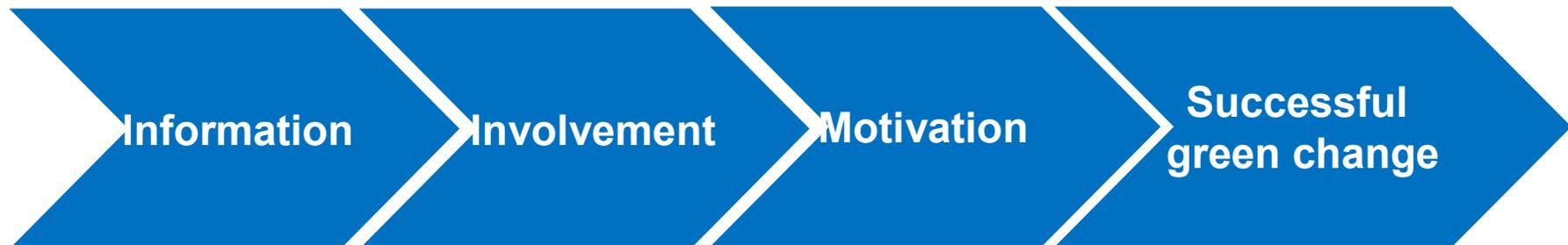


Management of greening effects: Examples in other job quality dimensions

- **Half managed effects on career and employment security, quarter – on health, only several – on work-life balance**
- **Career and employment security:** saving jobs, information and consultation, involvement of employees, adapting remuneration, ensuring equal opportunities
- **Health and well-being:** addressing disability, insurance, physical/psychological risks, work organisation & environment
- **Work-life balance:** commutation, culture, social infrastructure
- **Very few collaborative approaches, mostly with:** trade-unions, subcontractors, secondary schools, housing providers and kindergartens, general public

Link between green change and cultural change (I)

- Successful transition to a low carbon business is conditional upon overall development of staff
- Importance of awareness and acceptance of green change amongst employees
- Communication as a two-way process involving employees in anticipating and managing change



Link between green change and cultural change (II)

- **Favourable greening culture through “hearts and minds” of employees:**
 - Green change as imperative and not optional agenda
 - Shared vision and philosophy towards green change
 - Greening embedded in business operations from strategic to operational level by performance targets, incentives, competition
 - Green workplace representative with time-off to train and act
 - Additional efforts to engage blue-collar staff
 - A survey of staff on greening



Role of public authorities

- Clear, consistent and uniform **regulatory framework**
- Well-balanced, targeted and flexible **financial support** (e.g. use of UMF in the UK to stimulate environmental behavioural change at work; more active use of ESF)
- Additional **‘accompanying’ measures**:
 - Raising awareness
 - Providing guidance
 - Facilitating networks of SMEs
 - Adapting education and training policy and coordinating it with other public policies

Implications for further research

- **Difficulty in disentangling greening effects, unclear cause-effect relationships, differences across sectors, occupations and regions – need for detailed research at (sub)sector level**
- **Noticeable effects of economic crisis on employers' perception – would future research deliver more optimistic findings?**
- **Further research could also focus on:**
 - Innovative approaches to anticipate and manage green change (esp. for SMEs)
 - Greening strategies across value-chains



Thank you for your attention!

Simonas Gaušas,
Research Manager,
Public Policy and Management Institute (PPMI), Simonas@vpvi.lt

Dr. Radosław Owczarzak,
Research Manager,
Eurofound, Radoslaw.Owczarzak@eurofound.europa.eu

Skills for a Low Carbon Economy: **what next?**

**Licensing and certification to increase skills provision
amongst low carbon SMEs in the UK**

Nick Jagger, Tim Foxon, Andy Gouldson

**Centre for Climate Change Economics and Policy, University of
Leeds, N.S.B.Jagger@leeds.ac.uk**

Paris, 27 February 2012

Outline

- Licensing has been used in parts of the UK Construction sector to ensure standards
- Various UK low carbon initiatives have a skills licensing element to them
- However track record is ambiguous and under researched



Defining licensing

- Licensing involves the requirement for certification based on specific qualifications in order to practice
- Licensing can have a statutory basis, be linked to funding access or result from sectoral agreements
- Traditionally associated with safety critical occupations



Historic use of licensing in the UK construction sector

- UK construction dominated by SMEs – 93% of the 200,000 UK firms with less than 13 people
- Licensing concentrated in safety critical areas – gas electrics and scaffolding



UK low carbon licensed occupations

- Energy Auditors – Produce Energy Performance Certificates (EPCs) and many will become Green Deal Assessors
- Microgeneration Certification Scheme (MCS) installers – Minimum levels of competence and commitments to training by installation companies



UK Green Deal licensing

- Green Deal Advisors – will have an individual licensing system
- Green Deal Installers – still unsure but a mix of individual and company level competent person licensing based on MCS and Electrical schemes



Track record with licensing

- Evidence from the US suggests licensing is associated with higher wages, but no clear changes to safety or competence
- Evidence from non-construction licensing in the UK suggests benefits in terms of consumer confidence



Employment skills and growth in UK low carbon sector

- Scope for UK low carbon and environmental goods and services employment growth from 880,000 to 1,280,000 by 2017
- Leeds city region study shows potential for 4,500 energy efficiency jobs reducing energy bill by £1.2 billion and emissions by 36%



Conclusions and discussion

- Licensing requires robust underlying qualifications and it is not clear if there will be time to develop these for the Green Deal
- There is ambiguous evidence about the impact of licensing beyond improved consumer confidence



By Nick Jagger, Timothy Foxon and Andy Gouldson

This paper focuses on the use of licensing as a means of increasing skills provision and certification amongst a range of low carbon occupations in the UK. This paper is part of a programme at the Centre for Climate Change Economics and Policy (CCCEP), which has identified the range of market and governance failures in the provision of low carbon skills and the measures adopted to address these failures (Jagger et al., 2011). Currently, licensing is used in the UK for Energy Auditors producing Energy Performance Certificates and for SMEs working under the Microgeneration Certification Scheme. Additionally, similar licensing schemes are currently under development for Nuclear New Build Inspectors, Green Deal Assessors and Green Deal Installers. These new schemes will be critical to the success of the proposed UK nuclear new build and the Green Deal Scheme, which enables household to finance energy efficiency improvements recommended by an accredited adviser and undertaken by an accredited installer. Work by the authors for CCCEP's Mini Stern Review, for Leeds City Region, highlights the size of the potential Green Deal market and types of skills that will be required (Gouldson et al., 2011) and provides a local case study of licensing. Previous UK experience with CORGI, Gas Safe and Electrical Installers licensing schemes have shown increased competence and consumer confidence with gas installers and electricians using these schemes, who largely come from SMEs. As such, it is hoped that the new licensing low carbon schemes will provide greater low carbon skills and greater confidence in these skills. This paper will examine the potential for increasing the use of licensing and certification for low carbon skills, the difficulties that could arise with this approach and how it aims to address relevant market failures.

Skills for a Low Carbon Economy: **what next?**

Greening local economies through stakeholders' mobilisation

Lessons from the project "Employment Centres and Sustainable Development" - France

Marie-Pierre Establie d'Argencé, Sylvaine Herold, Henri Le Marois
Alliance Villes Emploi
ave@ville-emploi.asso.fr

Paris, 27 February 2012



Evolving environmental legislation in France...

- The “Grenelle” sets ambitious objectives and targets for the building sector
- Recognition of territories’ role in climate change mitigation policies
- Green skills Plan (2009)

... resulting in important “skills gaps” for building sector’s workers:

Professionals have to learn to work differently and to better coordinate their work together on construction sites in order to achieve the desired overall energy performance.

The role of territories for innovative employment and skills adaptation strategies

Increasing role of **local authorities** to promote local employment strategies (social cohesion planning law, 2005)

Relevance of local scale to think skills' adaptations and economic transitions

Existing effective collaborative tools to organise transitions on territories: the “**Employment Centres**” (“Maisons de l'Emploi”)

Three main functions:

- Territorial observation, anticipation and adaptation
- Integrated employment policies
- Seize employment development and business opportunities

The project „Employment Centres and Sustainable Development“

Project's general objective: **better anticipate** Grenelle consequences on jobs and skills in the building sector

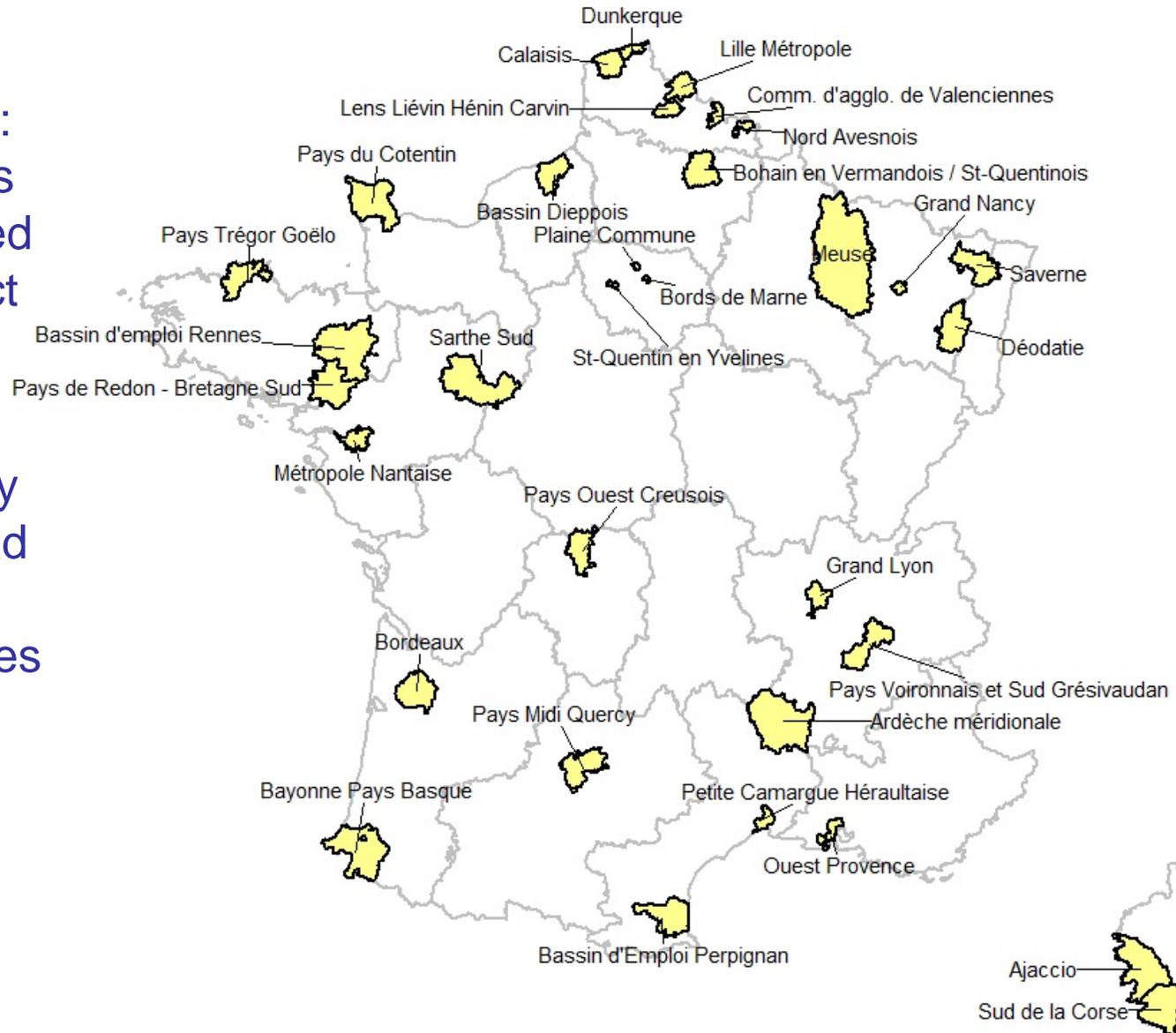
Methodology: stakeholders' mobilisation and collective action at local scale under the supervision of Employment Centres

Partners: French Environment and Energy Management Agency (ADEME) and Alliance Villes Emploi (“Cities Employment Alliance”)

Rationale: Grenelle general objectives and measures need to be adapted locally and to be appropriated by local stakeholders = **a bottom-up approach**

Since 2010:
33 territories
are committed
in the project

In 2012:
Project's
methodology
will be spread
to some 10
more territories



Main achievements

Vast stakeholders' mobilisation: ~1300 persons attended local participative working groups or steering committees

Local partnerships: new linkages, synergies and working habits between actors coming from very different professional sectors

Shared diagnoses and common understanding of the situation: a solid basis for collective actions

33 joint action plans to “green” local skills and jobs, representing approximately 500 local actions

Brief overview of the action plans

4 main levels of action:

- **Awareness raising and information campaigns** to communicate on jobs and skills evolutions
Different targets: works contractors, companies and their employees, job seekers and labour market institutions.
- **Adaptation and access to training**, especially for companies managers, workers and craftsmen;
- **Support to enterprises** development and organisation to progress towards improved services in link with energy performance or RE businesses
- **Promotion of local development strategies** around new activities to be found in the field of energy efficiency and RE for the building sector

Main policy recommendations

- **Local adaptation** of national schemes is crucial for policy effectiveness
- **Stakeholders' mobilisation** is a key factor of successful economic transitions and has to be effectively organised. It can be facilitated on territories by: a strong political will and a legitimate organisation (Employment Centres in our case)
- **Role of elected representatives** to catalyse local mobilisation and gather stakeholders around a shared and meaningful project
- Another important step for enhanced collective action: the **elaboration of shared diagnosis**

For more information:

Alliance Villes Emploi
ave@ville-emploi.asso.fr
www.ville-emploi.asso.fr

ADEME
<http://www.ademe.fr>
<http://www.pcet-ademe.fr>

Skills for a Low Carbon Economy: **what next?**

Greening Local Economy and Skills In Indian Context



Sunita Shanghi
Government of India

sunitasanghi1960@gmail.com

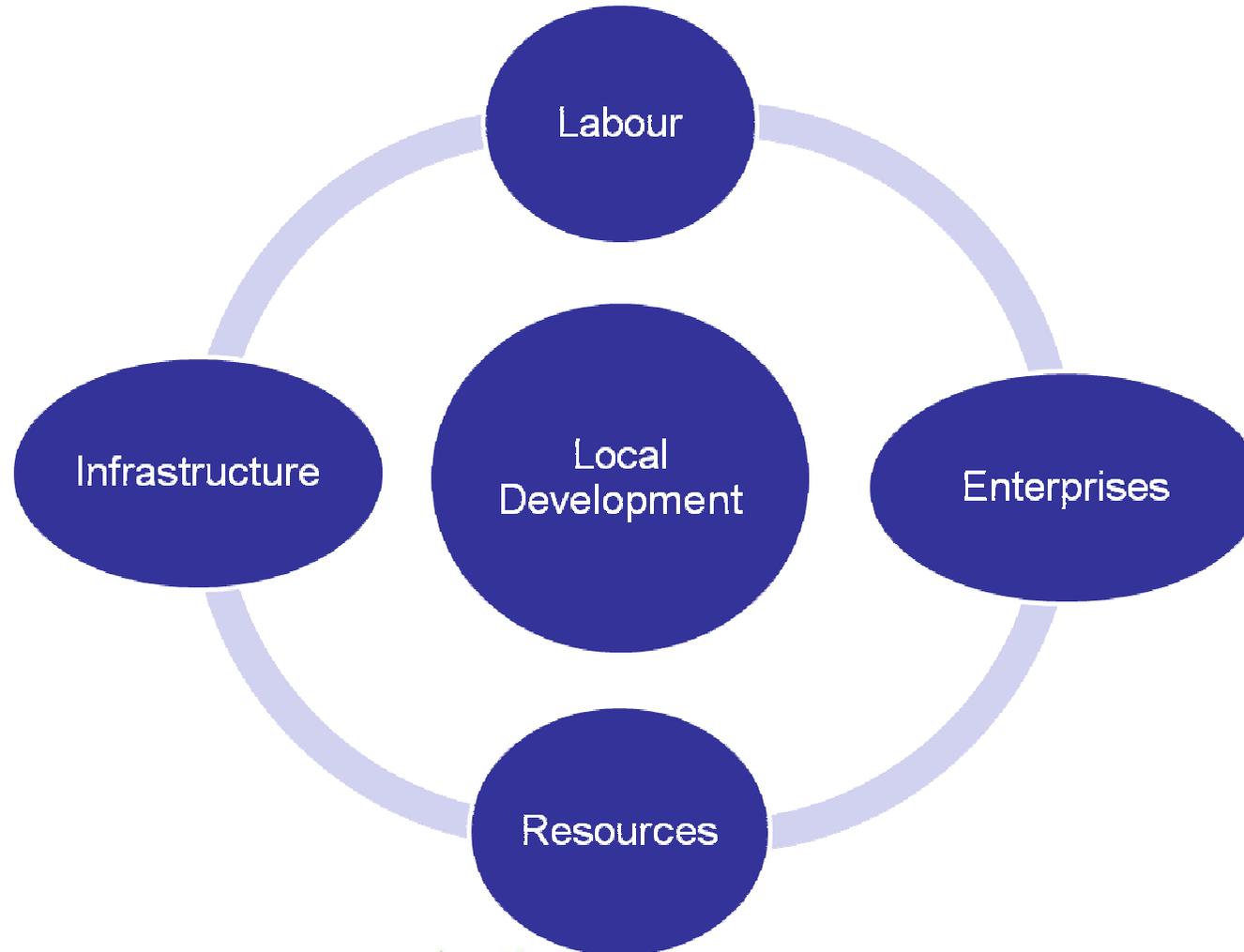
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Outline

- Overview
- India At a Glance
- Challenges of Low Carbon Inclusive Growth
- Defining Green Jobs
- Local Response Strategy
- Anticipating Skills
- Way Forward



Pillars of Local Development



Corner Stones for Green Transformation

- Government Intervention
- Community Mobilization
- Social Partners
- Adequate Investment



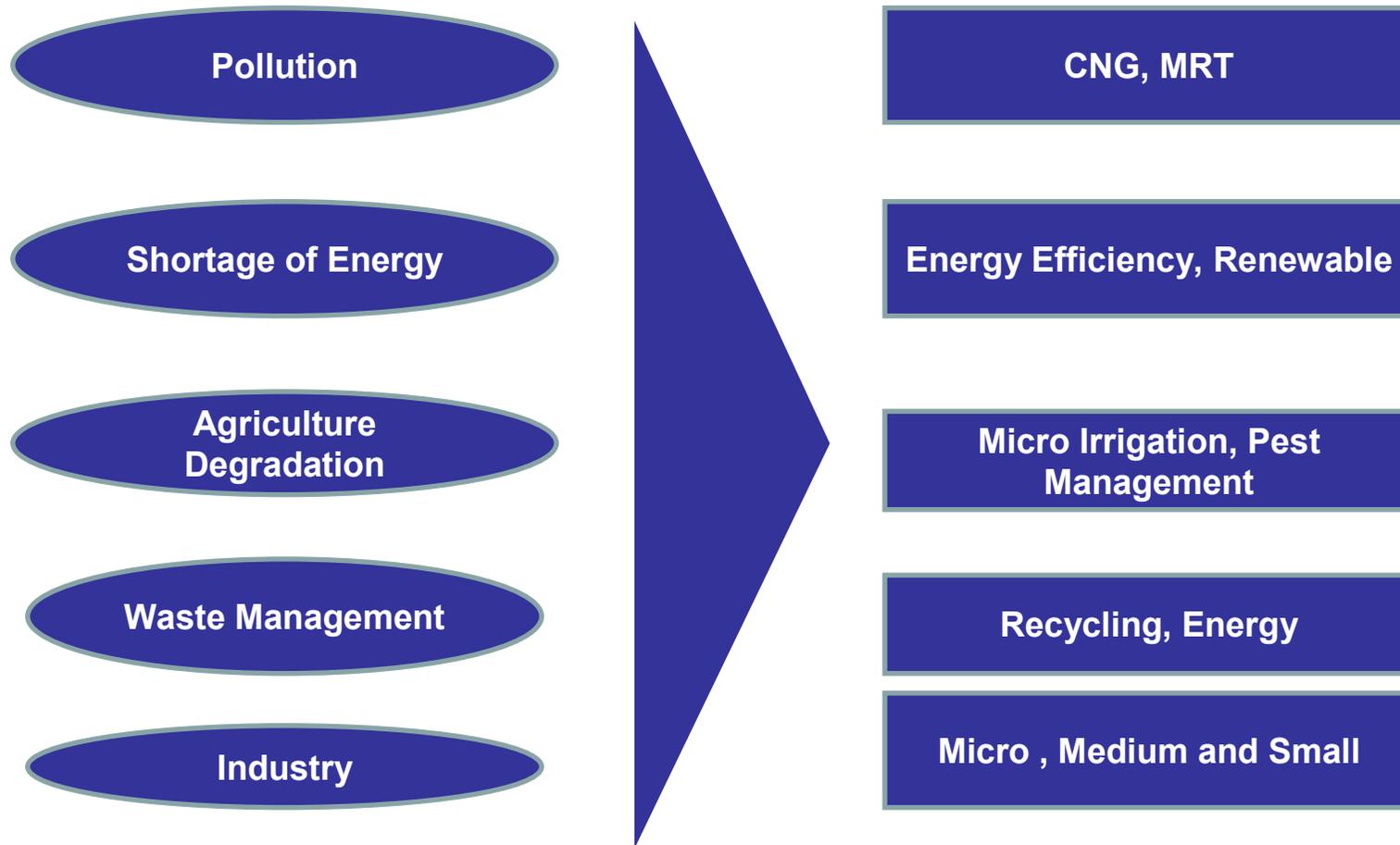
India: Land of world's Youngest Population but

- High drop outs in the education space
- Employability of the skilled a challenge
- Very low enrolments for VET
- In service training levels very low
- High concentration in Unorganised sector

→ → *Making Skills a major policy focus*



Challenges of Low Carbon Growth requires transformation



Greening Across Sectors leads to

- Creation of New Green Jobs
- Greening of Existing Jobs
- Greening of Occupations in Existing sectors

→ *Requiring different Skill sets which may or may not be available*



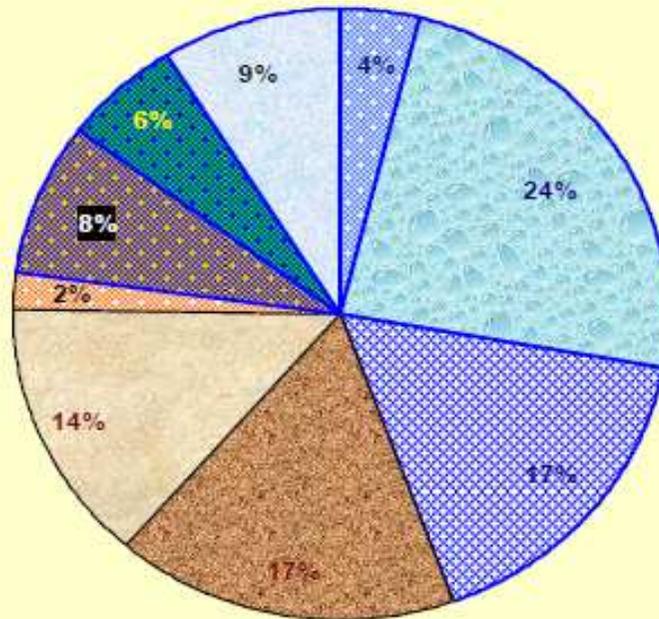
Learning's from Studies

- Local solutions for local problems using local resources
- Local Government responsible for public services such as Waste Management, Public Transport, Water Management, Afforestation etc.
- Spatial structure of Labour market important
- Interdependence among different policies
- Enabling the disadvantaged and unemployed to benefit from greener jobs
- Policies for matching the skill demand



Impact on Eco Restoration Sustainable Rural Livelihoods

Water Tables beginning to get recharged
Improvement in land productivity
Plantation/ afforestation



- Flood Control and Protection
- Water Conservation and Water Harvesting
- Provision of Irrigation facility to Land Owned by SC/ST/BPL/ IAY Beneficiaries
- Rural Connectivity
- Land Development
- Others
- Drought Proofing (Afforestation & Plantation)
- Micro Irrigation Works
- Renovation of Traditional Water bodies (incl. desilting of tanks, ponds)

Source: MORD

SEWA's Co-operatives for Waste Pickers

Waste Paper Products



Source: SEWA

Matching the Skills Through Anticipation

- Ad-hoc Surveys
- Sectoral Surveys
- Employment Surveys
- Labour Market Information System

→ → ***Underestimation of skill requirement stresses need for a system***



Looking forward

- Coordination among different players for policy coherence
- Active Participation of Social Partners
- Adding Value through appropriate Skills
- Robust Labour Market Information System
- Awareness Generation and Community Mobilization
- Effective Regulatory Framework





THANK YOU!



Skills for a Low Carbon Economy: **what next?**

Climate Change Adaptation and Local Development: The New Imperatives for Green Skills Development

Rao Pinninti

**Bloustein School of Planning and Public Policy
Rutgers University, New Brunswick, USA
krispinn@rci.rutgers.edu**

Paris, 27 February 2012



Overview

- Low Carbon Economy and Climate Change Governance
- Climate Change Adaptation and Local Economic Development
- Expanding Definitions of Green Jobs and Green Skills
- New Economic Growth Theory, Institutional Change and Enabling Policy Framework
- US Perspectives on Green Jobs and Climate Change Adaptation
- Integrating Green Skills, Local Development and Adaptation



Barriers to Green Skills Development

- Barriers to the expansion of green jobs and development of green skills are similar to those that pertain in the areas of adopting green economy, CCG in general and CCA in particular
- Lack of awareness about the full complexity and interdependencies of effective CCG
- Limited coordination across several major departments and entities, across policy making and implementation agencies, and filtering to the local government as well as various public sector units



Barriers to Green Skills Development

- Lack of understanding of the critical minimum thresholds to realize efficiency gains and increasing returns to scale (endogenous growth potential)
- Ineffective implementation of programs due to coordination constraints and lack of training
- Scale of operations too small (in several cases in the US) to depict positive gains that could motivate expansion
- Path dependency of some of the administrative agencies in terms of lack of integration with relevant CCG aspects



Recommendations

1. Scale up successful programs, with the use of cluster-based promotion of green businesses
2. Expand training and skill development mechanisms for workforce as well as employers (public and private) on a larger scale levels that augment adaptive capacity and enhance adaptive efficiency
3. Design green economic strategies with critical elements and their threshold magnitudes to reap the benefits of networking and endogenous economic growth



Recommendations

4. Ensure that climate change adaptation is mainstreamed into green growth strategies and sustainable development

5. Formulate and implement win-win-win strategies for local sustainable development incorporating ingredients of CCG, skills development, and accelerate smooth transition to a green economy





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PAPER I-A Knowledge sharing in early identification of skill needs
Christine Hofmann, ILO

By Christine Hofmann and Olga Strietska-Illina

Skills development is critical to unlocking the employment potential of green growth. To avoid future skill shortages, countries need to devise strategies based on well-informed policy decisions, social dialogue and coordination among ministries and between employers and training providers. Changes in skill profiles happen at all levels of qualifications and across all sectors. Coordination between skills and environmental policies, mainstreaming of environmental content across all training programmes, as well as designing specific courses for new or changing occupations are important building blocks of a coherent strategy to gear up education and training for greener jobs.

This contribution draws on findings published in the book '*Skills for green jobs: A global view*' which resulted from an ILO/Cedefop collaboration, and on findings from two sector studies on renewable energy and green building, and a comparative analysis of methods of skills identification, which resulted from a joint work between the ILO and the European Commission.

By Tanja Bacher, Gerhard Geiger, Markus E. Langer, Sigrid Nindl, Regina Steiner

An interdisciplinary consortium started 2011 in the context of the 2 years project 'Masterplan of Human Resources for Renewable Energies' to elaborate an integrated plan, a strategic document to ensure a medium and long term supply with human resources in the Austrian sector of Renewable Energies in all relevant technological fields (solar thermal energy, photovoltaic, wind energy, biomass energy, hydropower, ...). The project is funded by the Austrian Climate and Energy Fund and is coordinated by 3s research laboratory, a non-profit association for national and European research projects in the fields of knowledge, learning and work.

This Masterplan rests upon a broad, systematic, multimethodical analysis, e.g. including a screening of existing educational programmes and credit systems (in relation to recognition of qualifications) as well as quantitative/qualitative research on labour market requirements of green skills. Scenarios to ensure human resources for Renewable Energy Sources will be developed on the basis of this screening with a participatory approach considering relevant stakeholders. Generally, the Masterplan refers to three types of occupations: Green Increased Demand Occupations [GIDO], Green Enhanced Skills Occupations [GESO], and Green New and Emerging Occupations [GNEO]; specifically a competence matrix will be developed, based on the methodology of the VQTS model (developed in the LLL project VQTS, coordinated by 3s, awarded with the Helsinki and Lifelong Learning Award). The matrix focuses on the occupational field of 'eco energy technology' and shall support mutual acknowledgment of learners or workers competences in different education/VET systems. Framework conditions for credit transfer systems will be discussed and recorded on the basis of a 'common language of skills and competences', to support transparency, also in the sense of transitions and permeability of education/VET offers. In this context not only technical green skills are relevant, but also generic ones that can inter alia be related to education for sustainable development.

This Masterplan emphasizes a participatory and integrative governance approach. Besides educational, green skills and labour market experts also stakeholders from relevant political fields will be involved in the Masterplan's development process (via workshops and feedback circles).

Scenario based recommendations should serve as basis for decision-making of education and labour market policy concerning green skills supply in Austria. Certainly, such a Masterplan challenges questions on its democratic legitimacy: It can be regarded merely as a publicly funded project whose recommendations have no legitimation in formal terms. Nevertheless the open and participatory approach of this project carries potential to fulfill requirements emerging in political fields – on global, supranational, national and local level – concerning environment, macroeconomics and labour market. It also may be seen as tool for providing social innovative strategies to overcome job satisfaction inequalities, e.g. by opening up ways for people who were formerly excluded or hindered (e.g. women, elder people, migrants) to work in an emerging and promising green economy. In this sense, the Masterplan can be understood as a new form of governance striving for a 'win-win-win situation': for the environment, learners and workers, and for the economy.

By James Medhurst, Pat Irving, Joel Marsden

It is increasingly recognised that training in the full complement of skills is required across a broad range of jobs so that economies can become more green and sustainable. Research and experience suggest that a successful transition requires proactive steps to facilitate effective education and training, which better match the needs of enterprises. While skills development and training actions to foster green growth need tailoring to local circumstance, a global view can enhance the exchange of experience among policymakers, researchers and practitioners alike.

In 2009, the G20 afforded ILO responsibility for the development of a G20 Training Strategy. The resulting training strategy 'A skilled workforce for strong, sustainable and balanced growth' provides a platform for further exchange of ideas and experiences among a wide range of institutions, enterprises and experts from all countries. The strategy highlights five critical elements:

- Quality education as a foundation for future training
- Building bridges between the world of work and training providers to match skills needs to the needs of enterprises
- Continuous workplace training and lifelong learning to enable workers to respond to the increasingly rapid pace of change
- Anticipating and building competences for future needs to ensure early identification of skill needs
- Ensuring broad access to training opportunities, especially among vulnerable groups

Building on GHK's extensive experience in researching and evaluating policies for green growth, the paper applies the G20 principles to green skills training, identifying key actions for training providers by drawing on examples of good practice to ensure education and training at all levels is better aligned to the needs of a enterprises and entrepreneurs.

PAPER II-B Anticipating and managing the effects of greening of industries in the EU: skills development in the overall context of job quality
Simonas Gaušas, PPMI, Lithuania and *Radosław Owczarzak*, Eurofound

By Simonas Gaušas (PPMI), Radosław Owczarzak (Eurofound) and Agnė Paliokaitė (PPMI)

Research on employment effects of greening of industries largely focuses on job quantity, while effects on job quality are considerably less often addressed. For example, Employment in Europe 2009 report concluded that “<...> there appears to be almost no literature with an equivalent level of detail on working conditions within environment-related sectors in Europe” (European Commission 2009). Present research on the effects of greening on job quality focuses either on quantitative aspects such as development of indicators, forecasts (e.g. EMCO 2010, Cambridge econometrics et al 2011) or skills development (e.g. Cedefop 2010, Strietska-Ilina et al 2011).

Skills development is one of the most important dimensions of job quality. However skills are not developed by companies in isolation, separately from other dimensions of job quality. Skills development usually takes place in the overall context of transition to a higher job quality. The concept of job quality in this paper is based on the following four dimensions developed by Eurofound (Eurofound 2002):

- Career and employment security (e.g. employment status, income, workers’ rights, social protection);
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- Health and well-being of workers (e.g. health problems, risk exposure, work organisation); and
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Paper would aim to overview how companies anticipate and manage effects of greening of industries on job quality and what is the role of skills development in this context. Paper will overview approaches companies usually use to anticipate and manage effects of greening on job quality, dimensions of job quality which are most often addressed, cases of collaboration with other actors (e.g. government, social partners, NGOs, etc.) and cross-cutting issues which are of key importance for the overall development of the staff. Paper would try to distinguish practices of SMEs in this regard. Role of the government in facilitating the overall development of workforce for a green economy would be also emphasized.

Paper would be based on the findings of currently implemented Eurofound’s study “Growth and employment: anticipating and managing the effects of greening of industries in the EU” to be officially launched in the 2nd quarter of 2012, with PPMI as the sole contractor. It will use results of online survey, interviews and up to 50 company case studies carried out in the following ten target sectors: automotive, chemicals, construction, distribution and trade, energy, furniture, non-metallic materials, shipbuilding, textiles and transport. Evidence collected would not allow generalising neither at national nor at sector level, but rather to illustrate approaches that businesses currently adopt to develop their staff. The added value of this paper is that it will place skills development into overall context of raising quality of jobs in the greening sectors.

By Marie-Pierre Establie d'Argencé, Sylvaine Herold and Henri Le Marois

In France, buildings consume more than 40% of final energy. Reducing this consumption is one of the main objectives of French climate change mitigation policies (the "Grenelle" legislative package). This objective represents a major challenge for the construction sector, which needs to be ready to deliver buildings and renovations offering high energy performance.

If current construction and renovation technologies are able to deliver the expected results, they require though specific skills that do not have most of the companies of the building sector. This "skills gap" is a strong obstacle to reach the set objectives.

The project "Employment Centres and Sustainable Development", initiated by the French Environment and Energy Management Agency (ADEME) and the association "Alliance Villes Emploi" ("Cities Employment Alliance"), is based upon this assessment. The project launched on 33 local territories an innovative approach to trigger stakeholders' mobilisation in order to better anticipate climate change mitigation policies effects on employment and skills.

Employment Centres ("Maisons de l'Emploi") were created in 2004 by French Government, in the frame of its "Social Cohesion Plan", to federate all local employment and labour market actors within a single structure and around a single local employment promotion strategy. As such, they can act as strong catalysts of stakeholders' mobilisation locally and provide an appropriate frame to find concrete and transversal solutions to fill this skills gap.

On the 33 territories, the project allowed:

- To mobilise and gather all relevant stakeholders from the employment, training and building sectors: more than 1300 persons participated to local participative working groups.
- To create linkages and synergies between actors coming from very different professional sectors;
- To elaborate a common diagnoses of the situation and share common views on employment and skills challenges remaining to develop energy efficiency and renewable energies in buildings;
- To build and implement local action plans through this newly built partnership. These action plans act at three main levels:
 - Awareness raising and information campaigns to communicate on jobs and skills evolutions in that sector, targeting: works contractors, companies and their employees, job seekers and labour market institutions.
 - Adaptation and access to training for these different actors, especially for companies managers and craftsmen;
 - Promotion of local development strategies around new activities to be found in the field of energy efficiency and renewable energies in buildings.

After one year of local mobilisation and shared efforts to develop joint action plans, some lessons can already be shared.

First, this project shows that, in the field of climate change mitigation and sustainable development, national policies can only be effective through local appropriation and implementation by all relevant stakeholders.

Second, stakeholders' mobilization is a key issue for the success of these policies and has to be effectively organised. This can be highly facilitated by the existence, at the local level, of a strong political will and a legitimate organisation able to play this role. French "Employment Centres" proved to be relevant actors to fulfil this mission.

By Sunita Shanghi and Jeewan Sharma

The eco friendly approaches for adapting and mitigating the impact of the climate change on environment and economic growth affects the labour market. The market needs to adjust in terms of changes in the occupational structures and skill responses to be able to sustain the environment and growth. As a result of movement towards green economy while some new jobs are created, some existing are eliminated, in some existing jobs some new occupations may emerge and lastly there may be need to retrain some of the exiting employees to adapt to the changing conditions. Therefore, the main challenges required to be addressed include identification of skills, mapping availability and shortages of skills, infrastructure for skill development etc. This brings into focus urgency for coordination at policy planning stage, retraining of existing workforce, development of processes for identification of skills and community mobilisation. The present paper analyses these issues in the Indian context.

India enjoys a demographic dividend where the median age of its population is about 23.8 Years. It's growing at an average rate 8.2% per annum in the last five years. However, the growth is associated with the problem of restricting emission on the one hand and creation of suitable employment opportunities to sustain the carbon free growth. To meet the skill requirement of the changing economy a number of initiatives have been undertaken in terms of creating Centres of Excellence and recognising the prior learning. The active government intervention in upscaling the efforts for skill development, community mobilisation and NGO/Civil Society participation are helping in meeting the demands for growing economy to limited extent. To be able to integrate skill into the local development strategy it is necessary to have the Labour Market Information System and National Occupational Standards for all the occupations so as to have policy coherence. The process is underway in India. For the purpose of the paper the green jobs are defined as jobs that reduce the environmental impact of enterprises and economic sectors to levels that are sustainable. This definition covers work in agriculture, industry, services and administration.

By Rao Pinninti

Successful and efficient transition to a low carbon economy is conditioned by the human capital that facilitates this process. Local development needs to be integrated with the requirements of climate change adaptation, in addition to activities arising out of climate change mitigation. Climate change governance that encompasses both mitigation and adaptation activities requires an effective strategy to draw upon existing and new skills in order to scale up and expedite activities relevant in this context. An important pathway is to promote green job growth as an integral element of green policies and local economic development. Climate change adaptation remains a key element of local job growth, and the potential remains largely untapped. This route to local economic development draws upon the synergistic links between skill development, provision of relevant resources, and catering to the imperatives of climate change governance.

This paper offers a set of plausible new definitions of green jobs that are consistent with climate change governance, identifies focus areas for new skills development based on both mitigation and adaptation activities –current and future. The lists of projects and activities relevant at local development levels are then mapped into local as well as well non-local skill development activities that enable: a) effective transition to low carbon economy, b) integration with the adaptation activities, and c) align with local economic development strategies, including promotion of job growth. The roles of transaction costs and public policies to assist effective transition to green economy via development of green skills are clarified.

Besides providing a broad framework, this paper offers summary case study of the US green jobs policy approaches, scenarios, and changes in skill requirements. The current ‘process’ based and ‘output’ based approaches (as per the Department of Labor) to defining green jobs in the US are redefined to include climate change adaptation activities; the operations mandated by the Federal Directives on Adaptation are examined for their integration into: a) broader green job assessment, b) identification of newer requirements for skill development, and, c) integration with local economic development and job growth. It is suggested that a more comprehensive public policy toward green economy is required as an effective strategy for local economic development, green job growth, green skill development, and climate change governance.



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PAPER I-C **Think global, act local: the case for a global green skills training action plan**
Joel Marsden, GHK, United Kingdom

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PAPER II-A **Greening technical vocational education and training in the European steel industry**
Antonius Schröder, Technische Universität Dortmund – Sozialforschungsstelle, Germany

By Antonius Schröder

The contribution will refer to the first results of a European Lifelong Learning Programme funded project Greening Technical-Vocational Education and Training (GT VET). Within this project short termed vocational education and training (VET) pathways are explored to meet environmental and corresponding health and safety skill needs of the steel industry. As a model, the project will develop an industry driven European sustainable training module in correspondence with national VET systems. A partnership of steel companies (ThyssenKruppSteel Europe, ThyssenKrupp AST, Tata Steel, ArcelorMittal) and research institutes, from four member states, aims to identify and anticipate the impacts of environmental legislation on the everyday work of mechanical/industrial technicians and electrical technicians (for today and the future). Independent of the different VET systems of the member states, VET practices and learning outcomes need to be evaluated with respect to environmental skills, expertise and awareness. Based on these insights a European training module will be developed to obtain identical European learning outcomes in the field of green skills and sustainable awareness (for example, focusing on preventing pollution and securing occupational health and safety) complementing current technical VET programmes in this area. The module will be tested within four steel companies and member states (United Kingdom, Poland, Italy and Germany). Adjustments for each national system of VET will be made and learning outcomes will be evaluated with transferable credit points (ECVET).

Using the example of the steel industry and the VET of industrial, mechanical, electrical and electronic technicians, the modules and process of implementation might possibly be developed for adaptation and transfer to other technical VET professions and production industries. The aim is for the module and the tested implementation processes to become a blueprint for the updating and implementation of training for new skills into the VET system, which are focused on meeting industry driven requirements for environmental sustainability in an immediate and responsive way.

Beneath the conception of the project first results of industry driven job requirements on green skills for technicians and its reflection in the VET system (Germany, Italy, Poland and UK) will be presented as well as a first concept for the training module.

PAPER II-B **Anticipating and managing the effects of greening of industries in the EU: skills development in the overall context of job quality**
Simonas Gaušas, PPMI, Lithuania and *Radosław Owczarzak*, Eurofound

By Simonas Gaušas (PPMI), Radosław Owczarzak (Eurofound) and Agnė Paliokaitė (PPMI)

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Paper would aim to overview how companies anticipate and manage effects of greening of industries on job quality and what is the role of skills development in this context. Paper will overview approaches companies usually use to anticipate and manage effects of greening on job quality, dimensions of job quality which are most often addressed, cases of collaboration with other actors (e.g. government, social partners, NGOs, etc.) and cross-cutting issues which are of key importance for the overall development of the staff. Paper would try to distinguish practices of SMEs in this regard. Role of the government in facilitating the overall development of workforce for a green economy would be also emphasized.

Paper would be based on the findings of currently implemented Eurofound’s study “Growth and employment: anticipating and managing the effects of greening of industries in the EU” to be officially launched in the 2nd quarter of 2012, with PPMI as the sole contractor. It will use results of online survey, interviews and up to 50 company case studies carried out in the following ten target sectors: automotive, chemicals, construction, distribution and trade, energy, furniture, non-metallic materials, shipbuilding, textiles and transport. Evidence collected would not allow generalising neither at national nor at sector level, but rather to illustrate approaches that businesses currently adopt to develop their staff. The added value of this paper is that it will place skills development into overall context of raising quality of jobs in the greening sectors.

PAPER II-C **Licensing and certification to increase skills provision amongst low carbon SMEs in the UK**
Nick Jagger, Centre for Climate Change Economics and Policies, United Kingdom

By Nick Jagger, Timothy Foxon and Andy Gouldson

This paper focuses on the use of licensing as a means of increasing skills provision and certification amongst a range of low carbon occupations in the UK. This paper is part of a programme at the Centre for Climate Change Economics and Policy (CCCEP), which has identified the range of market and governance failures in the provision of low carbon skills and the measures adopted to address these failures (Jagger et al., 2011). Currently, licensing is used in the UK for Energy Auditors producing Energy Performance Certificates and for SMEs working under the Microgeneration Certification Scheme. Additionally, similar licensing schemes are currently under development for Nuclear New Build Inspectors, Green Deal Assessors and Green Deal Installers. These new schemes will be critical to the success of the proposed UK nuclear new build and the Green Deal Scheme, which enables household to finance energy efficiency improvements recommended by an accredited adviser and undertaken by an accredited installer. Work by the authors for CCCEP’s Mini Stern Review, for Leeds City Region, highlights the size of the potential Green Deal market and types of skills that will be required (Gouldson et al., 2011) and provides a local case study of licensing. Previous UK experience with CORGI, Gas Safe and Electrical Installers licensing schemes have shown increased competence and consumer confidence with gas installers and electricians using these schemes, who largely come from SMEs. As such, it is hoped that the new licensing low carbon schemes will provide greater low carbon skills and greater confidence in these skills. This paper will examine the potential for increasing the use of licensing and certification for low carbon skills, the difficulties that could arise with this approach and how it aims to address relevant market failures.

PAPER III-A | **Greening local economies through stakeholders' mobilisation. Lessons from the project 'Employment houses and sustainable development in France'**
Marie-Pierre Establie d'Argencé, Alliance Villes Emploi, France

By Marie-Pierre Establie d'Argencé, Sylvaine Herold and Henri Le Marois

In France, buildings consume more than 40% of final energy. Reducing this consumption is one of the main objectives of French climate change mitigation policies (the "Grenelle" legislative package). This objective represents a major challenge for the construction sector, which needs to be ready to deliver buildings and renovations offering high energy performance.

If current construction and renovation technologies are able to deliver the expected results, they require though specific skills that do not have most of the companies of the building sector. This "skills gap" is a strong obstacle to reach the set objectives.

The project "Employment Centres and Sustainable Development", initiated by the French Environment and Energy Management Agency (ADEME) and the association "Alliance Villes Emploi" ("Cities Employment Alliance"), is based upon this assessment. The project launched on 33 local territories an innovative approach to trigger stakeholders' mobilisation in order to better anticipate climate change mitigation policies effects on employment and skills.

Employment Centres ("Maisons de l'Emploi") were created in 2004 by French Government, in the frame of its "Social Cohesion Plan", to federate all local employment and labour market actors within a single structure and around a single local employment promotion strategy. As such, they can act as strong catalysts of stakeholders' mobilisation locally and provide an appropriate frame to find concrete and transversal solutions to fill this skills gap.

On the 33 territories, the project allowed:

- To mobilise and gather all relevant stakeholders from the employment, training and building sectors: more than 1300 persons participated to local participative working groups.
- To create linkages and synergies between actors coming from very different professional sectors;
- To elaborate a common diagnoses of the situation and share common views on employment and skills challenges remaining to develop energy efficiency and renewable energies in buildings;
- To build and implement local action plans through this newly built partnership. These action plans act at three main levels:
 - Awareness raising and information campaigns to communicate on jobs and skills evolutions in that sector, targeting: works contractors, companies and their employees, job seekers and labour market institutions.
 - Adaptation and access to training for these different actors, especially for companies managers and craftsmen;
 - Promotion of local development strategies around new activities to be found in the field of energy efficiency and renewable energies in buildings.

After one year of local mobilisation and shared efforts to develop joint action plans, some lessons can already be shared.

First, this project shows that, in the field of climate change mitigation and sustainable development, national policies can only be effective through local appropriation and implementation by all relevant stakeholders.

Second, stakeholders' mobilization is a key issue for the success of these policies and has to be effectively organised. This can be highly facilitated by the existence, at the local level, of a strong political will and a legitimate organisation able to play this role. French "Employment Centres" proved to be relevant actors to fulfil this mission.

PAPER III-B Identification of skill shortages, achieving policy coherence: the case of India
Sunita Shanghi, Planning Commission Government of India, India

By Sunita Shanghi and Jeewan Sharma

The eco friendly approaches for adapting and mitigating the impact of the climate change on environment and economic growth affects the labour market. The market needs to adjust in terms of changes in the occupational structures and skill responses to be able to sustain the environment and growth. As a result of movement towards green economy while some new jobs are created, some existing are eliminated, in some existing jobs some new occupations may emerge and lastly there may be need to retrain some of the exiting employees to adapt to the changing conditions. Therefore, the main challenges required to be addressed include identification of skills, mapping availability and shortages of skills, infrastructure for skill development etc. This brings into focus urgency for coordination at policy planning stage, retraining of existing workforce, development of processes for identification of skills and community mobilisation. The present paper analyses these issues in the Indian context.

India enjoys a demographic dividend where the median age of its population is about 23.8 Years. It's growing at an average rate 8.2% per annum in the last five years. However, the growth is associated with the problem of restricting emission on the one hand and creation of suitable employment opportunities to sustain the carbon free growth. To meet the skill requirement of the changing economy a number of initiatives have been undertaken in terms of creating Centres of Excellence and recognising the prior learning. The active government intervention in upscaling the efforts for skill development, community mobilisation and NGO/Civil Society participation are helping in meeting the demands for growing economy to limited extent. To be able to integrate skill into the local development strategy it is necessary to have the Labour Market Information System and National Occupational Standards for all the occupations so as to have policy coherence. The process is underway in India. For the purpose of the paper the green jobs are defined as jobs that reduce the environmental impact of enterprises and economic sectors to levels that are sustainable. This definition covers work in agriculture, industry, services and administration.

PAPER III-C Climate change adaptation and local development. The new imperatives for green skills development
Rao Pinninti, Rutgers University, USA

By Rao Pinninti

Successful and efficient transition to a low carbon economy is conditioned by the human capital that facilitates this process. Local development needs to be integrated with the requirements of climate change adaptation, in addition to activities arising out of climate change mitigation. Climate change governance that encompasses both mitigation and adaptation activities requires an effective strategy to draw upon existing and new skills in order to scale up and expedite activities relevant in this context. An important pathway is to promote green job growth as an integral element of green policies and local economic development. Climate change adaptation remains a key element of local job growth, and the potential remains largely untapped. This route to local economic development draws upon the synergistic links between skill development, provision of relevant resources, and catering to the imperatives of climate change governance.

This paper offers a set of plausible new definitions of green jobs that are consistent with climate change governance, identifies focus areas for new skills development based on both mitigation and adaptation activities –current and future. The lists of projects and activities relevant at local development levels are then mapped into local as well as well non-local skill development activities that enable: a) effective transition to low carbon economy, b) integration with the adaptation activities, and c) align with local economic development strategies, including promotion of job growth. The roles of transaction costs and public policies to assist effective transition to green economy via development of green skills are clarified.

Besides providing a broad framework, this paper offers summary case study of the US green jobs policy approaches, scenarios, and changes in skill requirements. The current 'process' based and 'output' based approaches (as per the Department of Labor) to defining green jobs in the US are redefined to include climate change adaptation activities; the operations mandated by the Federal Directives on Adaptation are examined for their integration into: a) broader green job assessment, b) identification of newer requirements for skill development, and, c) integration with local economic development and job growth. It is suggested that a more comprehensive public policy toward green economy is required as an effective strategy for local economic development, green job growth, green skill development, and climate change governance.



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