

**European Employment Observatory**

**EEO Review: The Employment Dimension of Economy Greening**

**Cyprus**

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## **1. Introduction**

Cyprus, an island with an area of only 9 250 square kilometres, has relied almost exclusively on imported fuel<sup>1</sup> (96 % of primary energy consumption in 2008) and to a far lesser extent on solar energy (used specifically for heating water in homes and other units). Until recently, there was no energy produced through wind, hydro power or biomass and very little reliance was placed on photovoltaics. Papastavrou (2007, p.2) notes that, in 2004, Greenhouse Gas (GHG) emissions were 10 281 kt CO<sub>2</sub> eq of which 7 613 kt CO<sub>2</sub> eq were from the sector of energy or 74 % of total GHG emissions. The bulk of the remaining GHG emissions originated in the transport sector. Most GDP is generated in the service sector and very little in manufacturing and agriculture and so these sectors are not heavy polluters (except for cement production).

Since most of the emissions produced are at coastal power stations and disperse quickly, particularly given the favourable local climatic conditions, and since the very intensive use of cars is relatively recent, the environment has not received the high priority that it deserves. There was no Green Party in Cyprus until 1996 and its first, and only, Member of Parliament was not elected until 2001. To the extent that a heightened environmental awareness has now been achieved, it is a recent phenomenon, reflecting the increased pollution resulting from cars in the cities, local failures in keeping the towns in pristine condition, the uncontrolled disposal of all kinds of waste (often in rural areas), the efforts of the Green Party, and the strictures of the European Union since Cyprus' EU accession in May 2004.

There is increasing sensitivity to climate-change issues as summers are thought to be getting hotter and more humid and the occasional droughts sensitise the local population to the vagaries of nature. These issues are important for the economy because they relate to possible strategies for tourism. If summers become too hot, then the traditional season for tourism could change or even disappear. Also, if as population ages, concerns about exposure to sunshine become severe, the size of tourist flows may decline even more than recent trends would suggest. Plans for building more golf courses are clearly dependent on an abundant supply of water. If droughts become more severe (there is very little information available on the local implications of global warming), then the golf-course strategy, which is exceedingly risky anyway, will become untenable. Climate changes can also affect agriculture, though this sector now contributes only modestly to GDP.

The employment implications of the possible climatic effects noted above are clear. Anything that curbs tourist flows and the demand for hospitality would also reduce the demand for the largely unskilled labour employed in this sector. This unskilled workforce is increasingly coming from other EU Member States (MSs) and third countries, as Cypriots have priced themselves out of this form of employment. To the extent that the construction of holiday homes, golf courses, hotels, etc, diminishes, the demand for unskilled workers would also fall. Finally, employment in agriculture can be expected to suffer. This would involve reduced demand for unskilled foreign workers but it may also induce local farmers to retire or seek employment elsewhere. There could be an *increase* in the demand for labour with skills in activities that involve coping with droughts and higher temperatures. This could include

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<sup>1</sup> Electricity production relies almost exclusively on imported oil. Total electricity production in 2008 was 4995.6 GWh (installed capacity of 1 118MW) using 1 241 465 tonnes of imported fuel. See internet: <http://www.eac.com.cy/EN/ourorganization/Pages/Generation.aspx>

individuals in the climate control industry (the import, installation and service of cooling units), water distribution technicians, desalination personnel, electricity generation technicians, and personnel in climate-related research and development. In other words, the implied redistribution would be away from unskilled towards skilled employment. It should be noted that the direct and indirect environment-related employment in Cyprus is less than 2 % and 3 % respectively.<sup>2</sup>

The response of the government during the crisis was to prop up the tourism and construction industries rather than to adhere to the plans, stated in the National Reform Programme Progress Report for 2009 (2009 NRP), to restructure the economy towards the provision of high value added services. Indeed, there are plans to cut support to the research community and funding for tertiary education. Thus, the crisis has steered policies in the wrong direction, compounding the future employment consequences of global warming. One reason for this is that governments and the social partners have been generally passive in their outlook on the employment consequences of climatic changes.

The just-proposed method for monitoring the performance of Member States in terms of green growth (see European Commission, 2009) shows that Cyprus has average performance in general except in what is described as ‘Market Functioning and Competitiveness’<sup>3</sup> where its performance is well-below average. At first sight, this assessment, which presumably relies on older data, gives a realistic picture of the situation in Cyprus as it was until recently. However, substantial changes are now occurring.

## **2. Labour market outcomes**

### **2.1 Green measures taken recently**

Cyprus had no quantitative reduction commitments under the Kyoto Protocol. In the March 2007 Presidency Conclusions, the European Council endorsed targets for the year 2020<sup>4</sup> and, in December 2008, the Council and European Parliament approved the measures that will help achieve these targets, including proposals to improve the EU Emissions Trading System (ETS) and the inclusion of aviation in the ETS. In Cyprus, the biggest user of oil and biggest contributor to GHG emissions is the electricity generation sector. Hence, it is important to begin discussion of the target of a 20 % reduction in GHG emissions relative to 1990 levels, and initiate developments in that sector.

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<sup>2</sup> European Commission (2009), p. 132. Cyprus is fifth from the bottom among MSs in this respect.

<sup>3</sup> This category relies on, among other indicators, the extent to which energy is produced from Renewable Energy Sources (RES), the amounts of municipal waste generated, and the extent of recycling.

<sup>4</sup> The general targets are (see European Commission, 2009, p. 108):

(i) A 20 % reduction relative to 1990 levels in GHG emissions,  
(ii) A reduction of energy consumption (through improved efficiencies) by 20 % relative to the projected 2020 levels and

(iii) An increase in the use of RES (wind, solar, biomass, etc) to 20 % of overall energy needs and 10 % of transport petrol and diesel consumption.

For Cyprus specifically, the RES target is 3.8 % (indicative target) by 2010 and 13 % of the total energy consumption by 2020, given that the 2005 starting point was 2.9 % - see the EU Official Journal of the European Union, 5.6.2009 (L 140/46), Annex I, National Overall Targets, Directive 2009/28/EC.

Other targets for Cyprus are to:

(a) increase RES electricity generation from 0.03 % to 6 % of total electricity consumption by 2010,  
(b) improve energy performance by 1 % of total energy consumption annually through economic measures and  
(c) reach the 10 % biofuel target in transport by 2020.

Using funding from the European Investment Bank (EIB) and the Structural and Cohesion Funds, the Vasilikos Energy Centre has been approved and will become operational by 2014. The aim is to set up a double terminal for (a) the importation/storage/vaporisation of Liquefied Natural Gas (LNG) which will be used to produce electricity more cheaply and with fewer emissions than is done currently using oil and (b) the importation/storage/distribution of petroleum products. The onshore LNG terminal will be the only import and re-gasification terminal under a 20-year derogation period from standard competition practices offered because of the country's special circumstances.

Other aspects of the drive to reduce emissions in the electricity generation sector and increase the use of Renewable Energy Sources (RES) (see targets (i) and (iii) in footnote 4) include the recent granting of over 20 licences (a capacity of over 400MW) for the construction and operation of wind farms whose output will feed into the grid system. This will roughly represent the required production of 6 % of electricity consumption through RES by 2010. It should be noted that the grid can currently accommodate only 31 % of total capacity (about 325MW) without stability problems.

Under a new Support Scheme for the promotion of electricity generation from large scale commercial wind systems, solar thermal and photovoltaic systems, and from the use of biomass, approval was announced for an 82MW wind farm of 41 turbines. Under the Support Scheme for 2009-2013, more wind power generators may be installed with total capacity of 165MW, as well as solar thermal systems (25MW) and biomass and biofuel systems (87MW). It is estimated that, by 2010, potentially 60GWh/year will be generated, meeting the 1 % (indicative) target of electricity consumption from biomass by that year; this target has now been revised to 2.5 % of conventional fuels used during 2008-2010 for transport.<sup>5</sup>

Also under the targets to reduce GHG emissions and increase the use of RES (see targets (i) and (iii) in footnote 4), the subsidised capacity of photovoltaic systems has been increased from 20KW to 150KW. In total 2.92 MW have been installed so far and a further capacity of 1.1MW will be installed on government buildings, schools and army camps by July 2010.

The target of reducing energy consumption (see target (ii) in footnote 4) is being pursued through a levy of 0.22 cent/KWh on electricity consumption which should encourage the reduction of use and through an Action Plan over 2006-2011, which promotes energy saving in the private and public sector. Incentives are also in place for the purchase of low emission vehicles (see NRP 2009, p. 91 for details). An ambitious new system of public transport has just been announced which will cover not only the major cities but also rural areas and routes between them. As new buses are introduced, energy savings and lower emissions should be achieved. A number of infrastructural projects will reduce congestion and fuel waste from idling cars.

In addition to measures taken to reduce the consumption of energy, the emissions involved in its production, and the proportion of energy that does not come from RES, increased emphasis has been given to Directives for the sustainable management of water resources and of waste. So far, seven urban agglomerations have made significant progress with treated

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<sup>5</sup> It should be noted that a study carried out by the Institute of Agricultural Research suggested certain difficulties with the biomass approach due to the shortage of water, fertile agricultural land, and competition for animal feed purposes. The Institute explored the potential use of biomass for biofuel (biodiesel, bioethanol, biogas and solid fuels) and energy production.

water which is now used to recharge aquifers. Treated sludge is used as fertiliser. Conversely, 50 rural agglomerations have only made organisational progress so far (see the NRP 2009, pp. 92-99).

The Strategic Plan for the Management of Solid Waste provides for the establishment, in each administrative district, of a plant for the management of solid waste. It also provides for the restoration of 113 existing, uncontrolled or partially controlled, landfills. A system of separating, collecting and recycling packaging waste has been put into effect in various municipalities and considerable enthusiasm and co-operation by the public has been shown. Efforts in these directions are under way and at various stages of completion. A Central Hazardous Waste Treatment Facility is expected to start operating during 2010.

A number of other initiatives involving the preservation of coastal areas, natural habitats and the protection of migratory birds have also been undertaken.

## ***2.2 Green measures and the labour market.***

The measures described above are capital-intensive and entail significant and highly specialised construction. The amounts of funding involved are substantial and will involve organisations such as the EIB and the Structural and Cohesion Funds in Cyprus. The burden for constructing these facilities will ultimately be borne by the local economy. While some of these initiatives are private, some involve the government and, to that extent, they will have fiscal and public debt implications.

Once completed, the facilities will require operation by specialised personnel who will benefit, in terms of their productivity, from the substantial capital investments that will have been made. Some of these personnel may have to be imported, at least initially. Productivity increases can be expected relative to current operations and these may ultimately find their way into the earnings of the individuals involved. There will also be opportunities to re-design personnel pools, avoiding some of the inflexibilities involved in the current employment structures that characterise the semi-governmental sector responsible for the provision of utilities.

The overall employment effects of going green are difficult to anticipate and, in EU documents, they are generally expected to be neutral. There is a large pool of highly educated personnel in Cyprus and, while some foreign expertise may be initially needed, there is every likelihood that Cypriot workers will ultimately be able to take over. Such an outcome would fit in with efforts to restructure the economy towards higher value added activities.

Programs to improve energy efficiency are likely to reduce the running cost of energy to individuals, firms and other organisations. However, there will also be capital costs involved which will need to be amortised, thereby raising running costs.

The new green facilities may stimulate closer interaction between them and research institutions such as the Cyprus Institute and its various centres, the University of Cyprus and the Technological University of Cyprus. These institutions would also have a major role to play in training the future employees of the new facilities. The Research Promotion Foundation is actively encouraging various environmental initiatives under the EU co-funded programmes URBAN-NET, MARFISH; and ERA-CO-BUILD. Thus, going green dovetails with efforts to increase the economy's capacity in tertiary education and research.

### **3. Review of labour market policy developments**

#### ***3.1 Labour market adaptability***

Most of the current training programmes (some of them co-funded by the European Social Fund) are oriented towards features of the economy as it *currently* stands. There is no programme training individuals for assuming positions in wind farms, to give an extreme example. Existing programmes include initiatives for training the unemployed, young entrants and tertiary education graduates, women who wish to re-enter the labour force after fulfilling family responsibilities, entrepreneurs, and so on. These will be useful at a time of re-structuring but they are not explicitly directed at the new green initiatives.

Current occupational and sectoral forecasts by the Human Resources Development Authority reflect the needs of the economy under current, pre-green, arrangements and within the existing occupational structure. The methodology used for arriving at these forecasts relies on historical data and projections, analytical methods which cannot cope with the sudden emergence of new needs.

#### ***3.2 The current reforms***

The changes described earlier are important in themselves and their cumulative impact on energy generation and use, emissions, and environmental sustainability will be substantial. The general mindset is gradually changing and the response of the public is encouraging.

It should be noted that most of these changes rely on direct control, directives, and on the availability of environment-friendly alternatives, rather than the price mechanism, in order to achieve environmental objectives. This approach places substantial initial costs on governments with important implications for their fiscal position and debt management. One notable policy involving the tax system is the charge of EUR 0.22 cent/KWh on the consumption of electricity. This tax should raise revenue, it does not involve any expenditures, and will encourage conservation. Its size and impact have not been investigated. There is considerable experience in this direction in North America and studies generally find that such charges achieve the intended environmental effects. Naturally, the system of pollution permits is also based on the same principle and this has also worked well elsewhere.

### **4. Conclusions**

If, as predicted, global temperatures continue to rise, short and long term tourism (based on hotels and holiday-home ownership respectively) may suffer. This would be exacerbated by any concerns about exposure to sun among aging populations and by the environmental degradation that has been occurring in Cyprus. The green initiatives adopted may ultimately moderate climatic change (restoring tourism) but, in the meantime, they are likely to shift employment from the low-skill provision of services to tourists (including construction), to areas which demand more human capital. This reorientation would fit in with the avowed intentions to restructure the economy towards the provision of high value added services in tertiary education and research, conference tourism, business and medical services.

However, the current economic crisis has led the government to moderate the pace of restructuring, propping up tourism and construction instead. This, despite evidence that fiscal

injections are not effective, especially when not directed at infrastructure and investment (see Ilzetki et al, 2009).

Many of the environmental initiatives adopted rely on quantity controls rather than the price system to achieve environmental objectives. This approach involves expenditures, rather than raising revenues as taxes do, and may lead the government to further inconsistencies in terms of the pursuit of its long-term objectives.

## **Bibliography**

*Cyprus Environmental Technologies Action Plan Road Map*, 2005. Internet: [http://ec.europa.eu/environment/etap/policy/pdfs/roadmaps/cyprus\\_en.pdf](http://ec.europa.eu/environment/etap/policy/pdfs/roadmaps/cyprus_en.pdf)

*Cyprus Timber Market Statement*, September 2009. Internet: <http://timber.unece.org/fileadmin/DAM/country-info/cyprus.pdf>

Cyprus Planning Bureau, *Lisbon Strategy - Revised National Reform Programme (NRP 2009)*, 2009. Internet: [http://ec.europa.eu/growthandjobs/pdf/nrp2009/cy\\_nrp\\_en.pdf](http://ec.europa.eu/growthandjobs/pdf/nrp2009/cy_nrp_en.pdf)

European Commission, DG-REGIO, *Study on Strategic Evaluation on Transport Investment Priorities under Structural and Cohesion funds for the Programming Period 2007-2013, Country Report Cyprus*, carried out by ECORYS Nederland BV Rotterdam, September 2009. Internet: [http://ec.europa.eu/regional\\_policy/sources/docgener/evaluation/pdf/evalstrat\\_tran/cyprus.pdf](http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/evalstrat_tran/cyprus.pdf)

Electricity Authority of Cyprus. Internet: <http://www.eac.com.cy/EN/ourorganization/Pages/Generation.aspx>

*Environmental Policy Review, Annex: Environmental Policy Actions in Member States. Cyprus: Highlights in 2008*, 2008. Internet: <http://ec.europa.eu/environment/pdf/policy/cyprus.pdf>

European Commission, *Employment in Europe, Climate Change and Labour Market Outcomes*, 2009, pp. 105-145. Internet: <http://www.cedefop.europa.eu/etv/news/default.asp?idnews=4925>

European Foundation for the Improvement of Living and Working Conditions, *Greening the European Economy: Responses and initiatives by Member States and social partners*. Internet: <http://www.eurofound.europa.eu/publications/htmlfiles/ef0972.htm>

European Union, Official Journal of the European Union, (I. 140/46), *Annex I: National Overall Targets*, Directive 2009/28/EC, 5 June 2009. Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF>

Howes, Tom, *The Biomass Action Plan 'European Bioenergy Business Forum'*

European Commission, Directorate General for Energy and Transport, 6 November 2006. Internet: [http://www.managenergy.net/download/biomass\\_ap.pdf](http://www.managenergy.net/download/biomass_ap.pdf)

Ilzetki, E. E.G. Mendoza and C.A.Vegh, *How big are fiscal multipliers?* Centre for Economic Policy Research, Policy Insight No. 39, October 2009.

Metaxas, A., *Strategic Plan for Sustainable Tourism Development in Cyprus*, Cyprus Tourism Organisation. Internet:

[http://www.moa.gov.cy/moa/agriculture.nsf/All/9A35D7840FC62453C22571490035C3CD/\\$file/Strategic%20Plan%20for%20Sustainable%20Tourism.pdf](http://www.moa.gov.cy/moa/agriculture.nsf/All/9A35D7840FC62453C22571490035C3CD/$file/Strategic%20Plan%20for%20Sustainable%20Tourism.pdf)

Papastavros, C., *Energy Efficiency and Renewable Energy: Cyprus - National study's summary*, Plan Bleu, Regional Activity Centre, Sophia Antipolis, March 2007. Internet: [http://www.planbleu.org/publications/atelier\\_energie/CY\\_Summary.pdf](http://www.planbleu.org/publications/atelier_energie/CY_Summary.pdf) Studies available at internet: <http://ec.europa.eu/environment/enveco/overviewstudies.htm>

Center for Renewable Energy and Energy Saving (CRES), *Factsheet for Cyprus: The Biodiesel Market in Cyprus DOES NOT WORK*. Internet: <http://www.cres.gr/biodiesel/pdf/fact%20sheets/Cyprus%20fs.pdf>