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No. 258/259 December 2006

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What energy ministers are doing

Coal comfort

Renewable promise

Poland and the OECD at 10

ENERGY

Changing gear

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RENEWABLE ENERGY EUROPE

26th - 28th June 2007
Feria de Madrid, Spain



“ Investment in utility-scale renewable generation will exceed €50 billion by 2011, excluding large hydro. Europe's top-20 utilities plan to double their renewables' capacity in the next five years and have already earmarked over €19 billion solely for renewable energy projects”

Alex Klein, EER

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Renewables are here to stay and they are growing in importance. This in turn means that there is new build in a number of renewable sectors, there are important strategic decisions being made at national level, there is a need for equipment and expertise across the industry and across Europe.

By launching Renewable Energy Europe and co-locating this exciting new event with POWER-GEN Europe and POWER-GRID Europe, PennWell Corporation has put together a total-solutions package. POWER-GEN Europe is already the established home of the conventional power generation industry in Europe. Bring in the key players from the renewable industry and the transmission and distribution industry and your entire market is in one place.

The exhibition will be complemented by a high-level conference that addresses the key technological and strategic issues facing you and your company.

Renewable Energy Europe is your chance to make contact with leaders and decision-makers from the top European power utilities. Your chance to talk to the power industry as a whole, and not just a smaller section interested in just one form of generation or issue.

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OECD Economic Outlook

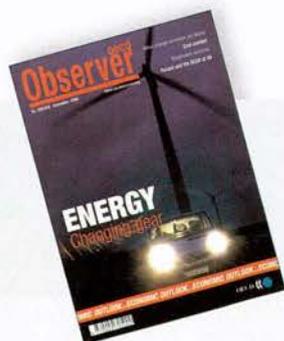
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On the cover

**Energy
Changing gear**

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Today's global energy situation is vulnerable, dirty and expensive. Fortunately, we have the tools to make energy smarter, cleaner and more cost-effective. The smart solution is an energy mix based on better technologies and, above all,

greater efficiency. New strategies are affordable, but will only work if we embark on them without delay. With uncertainties surrounding global warming, price and security of supply, we must step up the momentum.



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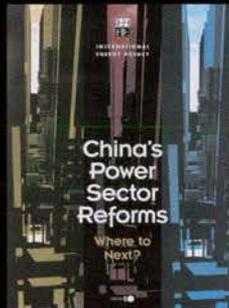
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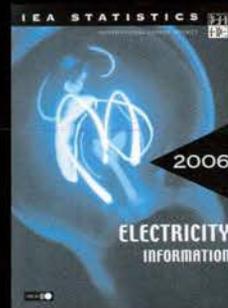
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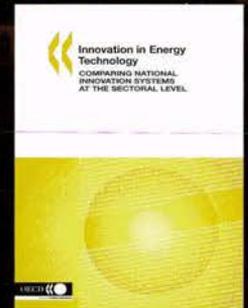
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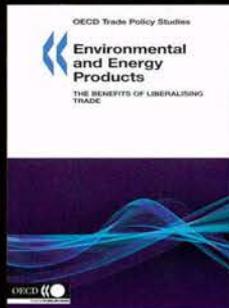
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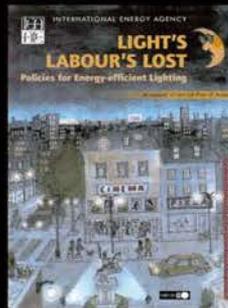
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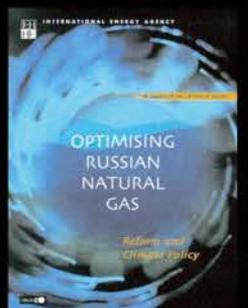
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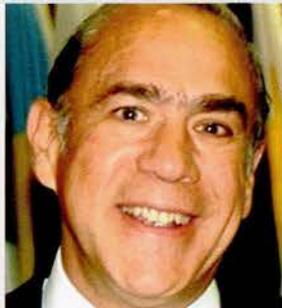
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Energising change

Angel Gurría, Secretary-General of the OECD

Energy has moved to the top of our policy agendas, and with good reason. First, there is the price of oil, which though easing a little in recent months, remains historically high. This has pushed up costs for producers and consumers alike.

Second, there is the security of supply, as conflicts and geopolitical uncertainties threaten oil and gas flows in particular.

But the main reason for our wake-up call on energy is global warming. We now know that greenhouse gas emissions from transport and power generation are partly responsible for this fact.

Energy is the heartbeat of growth and development, and is a globalisation issue *par excellence*. Over 70% of new energy demand in the next 25 years will come from developing countries, a third of that in China, but economic activity in developed countries will remain a major source of emissions. Devising new energy strategies for our world will demand international co-operation which the OECD must help forge. What are the steps forward?

The recent Stern Report, commissioned by the UK government, argued that climate change, if left unchecked, would cost between 5% and 20% of worldwide GDP. However, the report said it would cost just 1% of GDP to correct. Another report by PricewaterhouseCoopers in September came to a similar conclusion. The International Energy Agency, a sister body of the OECD, in its latest *World Energy Outlook*, also warns of the dangers of following our current energy path and considers different policy scenarios.

We may all differ on precise numbers, but the task remains the same. As the IEA puts it, our global energy situation is vulnerable, dirty and expensive. Fortunately, as OECD and IEA work shows, we have the tools to make energy smarter, cleaner and cost-effective. New strategies are affordable, but will only work if we embark on them without delay.

Looking for options gives rise to passionate debates, about the car industry, nuclear energy, markets, taxation and regulation. There is excitement over renewable energy technologies, not least because of the business opportunities these provide.

Listening to the arguments and sizing up the facts is one of our main jobs at the OECD, so that we can help governments decide how to proceed. Our message to all sides is simple: renewable energy technologies are not a panacea, far from it. And "business as usual" with fossil fuels is not an option. The smart solution is an energy mix based on better technologies and, above all, greater efficiency.

Striking a new energy approach is a realistic way forward since it means implementing policies already being considered. Demand for

energy is rising and so all energy sources must be involved, whether oil and gas, carbon sequestration, nuclear power, biomass, wind or solar energy. Some new technologies will have to be further developed, and others made more effective.

Take coal. This is the most carbon-emitting fuel in power generation, but it is an abundant and dense energy source. China is the world's largest user of coal and it is the main fuel for electricity generation in the US and Germany too. Its use is set to go on rising. Equipping new coal generators with technologies to capture carbon to reduce emissions and increase efficiency will be important.

In fact, policies that promote efficiency in output and use of energy contribute to 80% of the CO₂ emissions avoided under the IEA's alternative policy scenario. This demands changes which governments can promote.

Setting effective fiscal policies is an obvious step. We know taxes can discipline energy use. However, energy products and motor vehicles already account for the largest number of environmentally-related taxes in the OECD area. Their effectiveness could be improved if some exemptions to energy and motor vehicle industries were better controlled. As for subsidies, these should target cleaner energy innovations and practices, and not distort or protect markets.

Governments must provide a business environment that incites change and encourages new energy models. They must be innovative in funding research and demonstration, and promoting competition in all energy markets. Government can lead the way in their own procurement practices, in cleaner transport contracts, for instance. And carbon trading must be allowed to function.

Governments can also lead by setting building standards and energy requirements for industry. Such standards should spur market opportunities among energy suppliers and promote energy-efficient habits among businesses and households, in building insulation, heating, lighting or transport.

Many initiatives will be nationally or locally focused though with a global impact. And as we focus on solving the side-effects of our insatiable appetite for energy, let us not forget that 1.6 billion people have no electricity at all. Over a million people, mainly women and children, die every year because of fumes from inefficient cooking stoves. We must do more to bring modern energy systems to developing countries and save lives.

Do we have the political will to change? The messages in this edition's special roundtable of OECD ministers responsible for energy policy reflect a determination which suggests that we do. Thus, we must step up the momentum. Time is not on our side. ■

Australia

A leader in global co-operation



©AFP/Torsten Blackwood

Ian Macfarlane
Minister for Industry, Tourism and Resources

Australia's energy policies are underpinned by the themes of prosperity, security and sustainability. Our goal is to maintain a thriving economy while strongly positioning ourselves to reduce greenhouse gas emissions.

Australia's recent domestic energy initiatives have included an overhaul of our fuel excise system; removal of market impediments to the commercial development of renewable technologies; provision of funding to leverage private investment in low emission technologies; and the encouragement of continued energy market reform.

Meeting our increasing energy needs while lowering environmental impacts will require significant international co-operation as well as a strong domestic framework. Australia is fostering greater regional and global co-operation through our roles within key international energy fora.

In December 2006, the International Energy Agency Governing Board convened in Sydney, with an Australian, John Ryan, as Chair. It was the first such meeting held in the Asia Pacific region in over a decade.

Next May, Asia-Pacific Economic Cooperation (APEC) energy ministers will meet in Darwin to strengthen APEC's Energy Security Initiative and work on the development of policies and measures that will promote cleaner and more efficient energy technologies.

Australia has committed AUS\$100 million over the next five years to the Asia-Pacific Partnership on Clean Development and Climate, with more than half of that recently allocated to investments in cleaner and environmentally-sustainable systems of energy supply.

Australia also plays a significant role in the work of the Carbon Sequestration Leadership Forum, the International Partnership for the Hydrogen Economy and the Methane to Markets Partnership.

Energy security and sustainability are the responsibility of all countries—ignoring the issues or choosing the wrong strategies to deal with them will ultimately be disastrous for global prosperity—whether a nation is resource rich or resource poor. ■

Visit www.industry.gov.au/

Roundtable

What ministers are doing

Building a new global energy strategy to improve efficiency and tackle global warming requires political leadership. It also demands practical, hands-on policy action. It is one thing for governments to recognise that energy is under-invested, vulnerable and dirty, but are they starting to move? In this, our fifth ministers' roundtable since 2001, we ask five OECD ministers responsible for energy from a cross-section of representative countries to answer the following simple question:

Canada

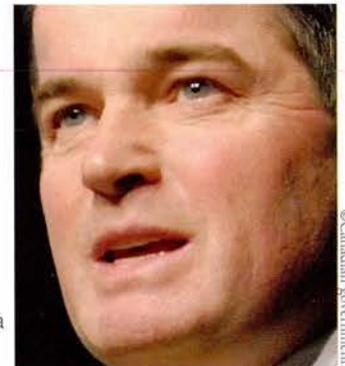
A clean energy superpower

This year the prime minister of Canada, Stephen Harper, outlined his vision of Canada emerging as an energy superpower capable of delivering energy to the world. Canada is arguably

the only stable, democratic country in the world with growing energy-export capability. It is second to Saudi Arabia in proven oil reserves, third in global gas production, second in hydro-electric generation, first in uranium production, and the largest energy exporter to the US.

By 2015, we expect Canada's oil production to exceed 4 million barrels a day. Canada's market-oriented approach to energy policy, and our openness to foreign investment, will serve us well in this regard.

Of course, with this natural endowment comes opportunities and responsibilities. These resources must be managed responsibly. Canada has the means to meet a significant share of the world's energy needs while



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Gary Lunn
Minister of Natural Resources

DIABLE

What actions are you taking to make energy more secure, cleaner and cost-effective?

The five ministers are: Ian Macfarlane, **Australia's** Minister for Industry, Tourism and Resources; Gary Lunn, Minister of Natural Resources for **Canada**; Michael Glos, Minister of Economics and Technology in **Germany**; Akira Amari, Minister of Economy, Trade and Industry in **Japan**; and Odd Roger Enoksen, Minister of Petroleum and Energy for **Norway**.

containing and reducing the environmental consequences of production.

Our next challenge is to become a *clean* energy superpower. To do this, we must address the fact that the greatest source of untapped energy is the energy we waste. We must also increase our use of renewable energy and science and technology to make conventional energy cleaner.

Canada's Clean Air Act and its Regulatory Agenda form the backbone of the government's environmental plan which, for the first time in Canadian history, emphasises regulatory action to limit air pollutants and greenhouse gas emissions in the short, medium and long term.

Through this agenda, we are pursuing advances in science and technology to help us produce and use energy more efficiently. We are promoting conservation efforts. We are pursuing cost-saving innovations, such as clean-coal technology, to radically reduce emissions from coal-fired facilities; light bulbs that reduce energy consumption by 90%; tidal turbines that harness the energy of the sea; and carbon dioxide captured and stored in the ground.

These are some of the actions Canada is taking to make energy secure, clean and cost effective. By helping other countries benefit from these innovations, Canada hopes to contribute to a clean global-energy future. ■

Visit Natural Resources Canada at www.nrcan.gc.ca/

Germany Energising the market



Michael Glos
Minister of Economics and Technology

Securing an economical, reliable, and environmentally-friendly energy supply is one of the top priorities of international as well as national policy nowadays. Global energy needs will be increasing rapidly in the decades ahead. At the same time, markets are changing and climate protection remains a Herculean task.

To improve energy supply security we need open and free markets. Free trade fosters the optimal distribution of scarce energy resources. Competition can develop its impact; greater efficiencies are achieved; exploration projects are implemented; and new technologies evolved. Those technologies that last will be beneficial and secure and, at the same time, the most climate-friendly.

Effective climate protection presupposes a clear awareness among all countries of the global costs and the consequences of climate change. For climate protection to succeed, an international climate regime must be broadly accepted. Not only the US, but also large and fast growing emerging countries such as China, India, Brazil, Mexico and South Africa must commit themselves to effective measures. An isolated climate protection policy conducted unilaterally at national level is both ecologically ineffective and economically fatal. The purpose of climate protection is not to strangle development opportunities or slow down economic growth. Rather, reasonably structured climate protection measures help all of us, including at the economic level. It is therefore important for everyone to participate, and to use market instruments such as emissions trading, which must be further developed on a global scale.

If energy policy is to be environmentally friendly and sustainable, it must also aim at significantly enhancing energy efficiency. The development of more efficient and environmentally-friendly technologies is indispensable, whether for energy production or for the manufacture of consumer goods. And functioning markets are the driving force behind this process. ■

Visit the ministry's website at www.bmwi.de/en
See also Mr Glos's website at www.glos.de/

Japan

A new national energy strategy



Akira Amari
Minister of Economy,
Trade and Industry (METI)

Today, energy heads policy agendas in every country. After decades of enjoying cheap and stable energy supply, the current energy supply and demand structure is extremely tight and unstable. We must explore economic development in light of the continuation of this severe energy situation. Furthermore, we need to implement reliable and sustainable policies to simultaneously address challenges of the global environment and energy security. In addition, energy demand in the Asian region is projected to grow very rapidly. With advanced technology and abundant experience, Japan intends to contribute actively to energy security in this region.

With this recognition, this May, I formulated our "Comprehensive Energy Strategy" in the Liberal Democratic Party. On the basis of this strategy, the government of Japan published a comprehensive and strategic action plan called the New National Energy Strategy.

The centrepiece of this strategy is establishing a state-of-the-art energy supply-demand structure by promoting energy efficiency, new and renewable energy, nuclear power and transport energy development.

In addition, Japan will strengthen its resource diplomacy, and energy and environmental co-operation, enhance its emergency preparedness measures and work on its Energy Technology Strategy.

To realise this, we have identified the following five targets that government and the public sectors share and should achieve by 2030:

1. Improve energy efficiency by at least 30%.
2. Reduce oil dependence to 40% or lower.
3. Reduce oil dependence in the transport sector to 80%.
4. Target the share of nuclear power in electricity generation to 30-40%.
5. Increase the share of crude oil owned by Japanese companies to 40%.

As minister responsible for energy at METI and having considerable experience in energy policy formulation, including promulgation of the Energy Policy Basic Law and the promotion of nuclear energy, I regard energy policy, which sustains economic activities, as one of my most important missions. I will implement energy policies effectively based on this new strategy. ■ Visit www.meti.go.jp/english

Norway

Making fossil fuel clean



Odd Roger Enoksen
Minister of Petroleum
and Energy

Can a small country play a significant role facing the global energy challenges? The answer could be yes. In the last ten years Norwegian offshore industry has captured carbon dioxide (CO₂) and injected it for permanent geological storage beneath the North Sea. Each year a million tonnes of CO₂ is injected offshore. Encouraged by the Norwegian CO₂ tax, carbon capture and storage curtails carbon emissions equalling 10% of the country's emissions from road traffic.

The Norwegian government and Statoil, a major energy company, have recently undertaken an agreement to establish the world's largest full-scale CO₂ capture and storage (CCS) project in conjunction with a projected combined heat and power plant at Mongstad, north of Bergen. The project is to be fully operational by the end of 2014. The first stage of the CCS project will be in place at the start-up of the proposed co-generation facility in 2010.

The Mongstad project will be the world's largest of its kind. By this we move from the research/small-scale phase to actual construction of a

full-scale CO₂ capture facility. Several technological solutions will be tested in parallel in the first phase of the project. This will be of great interest to any other future gas-fired power plants. The arrangement will ensure that technological developments in Norway will have a broad international relevance and will not be project-specific to our country.

This is an important milestone with global implications. As stated previously by the OECD and IEA, carbon capture and storage could eliminate large quantities of CO₂ if applied to fossil-fired plants around the world. Representing the world's third largest exporter of both oil and gas I am proud that Norway is pioneering CO₂ technologies which could pave the way to making fossil fuels a clean source of energy. ■

Visit www.dep.no/oed/english/

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• News brief •

Development aid stalls

Aid flows to the poorest countries in sub-Saharan Africa have stalled. This is the message from finalised data on aid flows for 2005. Official development assistance from members of the OECD's Development Assistance Committee (DAC), which groups the world's major donors, reached \$106.8 billion in 2005, a record high. But \$22.7 billion of this was for debt relief, mostly for Iraq and Nigeria. Official humanitarian aid also rose (to \$8.7 billion) in response to the Asian tsunami two years ago.

But removing these exceptional items reveals that the trend in development programmes for other countries is essentially flat. Aid to sub-Saharan Africa, outside Nigeria, actually fell by 2.1% in real terms to \$24.9 billion in 2005. Debt relief and humanitarian aid account for all the increase to the region since 2002.

This seems a long way from the Gleneagles and Millennium+5 summits in 2005 which extended earlier promises to scale up aid flows and to devote half the increases to Africa, resulting in a doubling of aid to the continent from 2004 to 2010. "Donors will need to undertake major expansions of their core development programmes for Africa if they are to meet this target", the DAC chief, Richard Manning, warned on releasing the news.

Separately, on releasing its **review of US development assistance** programmes, the DAC said that development needs should be accorded the same status as diplomacy and defence and the importance of poverty reduction more explicitly recognised within this mandate. It urged further coherence among all development co-operation actors, and recommended that the US improve public awareness of its development co-operation efforts. The US is the largest donor in the DAC in terms of volume of aid, reaching a record high of \$27.6 billion in net official development assistance in 2005. ■

For more information, see www.oecd.org/dac



Richard Manning

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Growth eases

Gross domestic product (GDP) in the OECD area rose by 0.5% in real terms (i.e., adjusted for inflation) in the third quarter of 2006, down from 0.8% in the previous quarter, according to preliminary estimates.

In the US, GDP grew by 0.4% in the third quarter of 2006, less than the 0.6% growth recorded in the previous quarter. GDP in the euro area rose by 0.5%, down from the quite high growth rates observed in the two previous quarters. However, Japan's GDP growth accelerated slightly, by 0.5%, after a 0.4% rise in the previous quarter. ■

See www.oecd.org/statistics

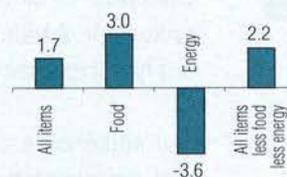
Inflation drops—

Consumer prices in the OECD area rose by 1.7% in the year to October 2006, compared with 2.1% in the year to September 2006. On a monthly basis, the price level eased by 0.2% between September and October 2006, after a decline of 0.1% from August to September. The drop in inflation mainly reflects a year-on-year fall in energy prices of some 3.6% in October, against a rise of 0.3% in September. The US saw a fall of over 11%. Consumer prices for food increased by 3% year-on-year in the OECD area

in October, unchanged from the year to September. Excluding food and energy, consumer price inflation also remained stable at 2.2% in the year to October. ■

Consumer prices

OECD total, Oct. 2006
% change on a year earlier



Source: OECD

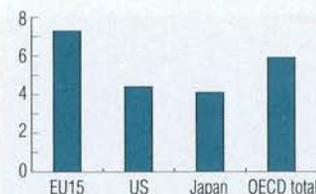
—and unemployment falls

Joblessness also edged down as the standardised unemployment rate for the OECD area fell to 5.9% in October 2006, 0.1 percentage point lower than the previous month and 0.6 percentage point lower than a year earlier. For the euro area, the standardised unemployment rate was 7.7% in October 2006, 0.1 percentage point lower than the previous month and 0.8 percentage point lower than a year earlier. The US's standardised unemployment rate for November 2006 rose to 4.5%, 0.1 percentage point higher than the previous month but 0.5 percentage point lower than a year earlier. For Japan, the rate was 4.1% in October 2006,

0.1 percentage point lower than the previous month and 0.4 percentage point lower than in October 2005. ■

Unemployment

% civilian labour force
Oct. 2006



Source: www.oecd.org/statistics

• News brief •

Chinese intelligence

This year China will for the first time spend more on research and development (R&D) than Japan and so become the world's second highest investor in R&D after the US, according to OECD projections based on recent trends. "The rapid rise of China in both money spent and researchers employed is stunning," said Dirk Pilat, who heads the OECD's science and technology policy division.

Based on recent trends, China's spending on R&D as a percentage of GDP, known as R&D intensity, has more than doubled, from 0.6% of GDP in 1995 to just over

1.2% in 2004. The country will spend just over \$136 billion on R&D in 2006, just over Japan's forecast \$130 billion. The US is predicted to remain the world's leading investor in R&D in 2006, spending just over \$330 billion. The EU-15 is predicted to spend just over \$230 billion.

"OECD countries need to make their research and innovation systems more efficient and find new ways to stimulate innovation in today's increasingly competitive global economy," Mr Pilat said. ■

See www.oecd.org/sti/outlook for more information on the OECD publication, *Science, Technology and Industry Outlook 2006*.

Migration benefits

Developed countries must do more to integrate immigrant workers, a new report says. Well-managed immigration flows offer benefits both for host countries and for migrants and their families, but integration into the societies where migrants settle requires commitment and action at national and local level.

Almost three million long-term migrants legally enter OECD countries every year in search of greater economic security. Their skills and energy bring benefits to

their host countries, but difficulties over integration also give rise to tensions. Immigration is likely to go on rising as OECD countries grapple with falling birth rates and ageing populations. The OECD argues that lessons from successful integration initiatives can be successfully applied elsewhere if administrations are willing to put necessary policy frameworks in place, including anti-discrimination legislation. The new OECD report, *From Immigration to Integration: Local Solutions to a Global Challenge*, analyses case studies in five countries: Canada, Italy, Spain, Switzerland and the UK. ■
See www.oecd.org/migration

Plus ça change...

"Solar radiation is a very difficult form of energy to exploit on a large scale owing to its initial dilution and the difficulty of tapping it over large areas. It seems well established that solar energy cannot at present compete in the highly industrialised nations with any of the many other forms of energy now vying with each other."

A.H. Delsemme, "Pilot experiments in international scientific co-operation", in No.15, April 1965

Observer oecd



©Dominic Eberharter/Reuters

Slippery slopes

Après ski could become an epitaph for a whole industry if warm winters continue. Many regions in the Alps have so far had the warmest November on record, a forthcoming OECD report warns, delaying the arrival of snow by several weeks and worrying ski operators. Whether due to climate change or just a one-off slip, warmer winters and a lack of snow threaten the Alpine ski industry and their regional economies.

As many as 80 million tourists ski in France, Austria, Switzerland and Germany each year, which translates into some 160 million skier days. New OECD analysis warns that recent warming in the Alpine region has been roughly three times the global average, with 1994, 2000, 2002, and 2003 already the warmest in 500 years. Greater changes in the coming decades are likely.

Germany is most at risk, the report posits, with the 1°C warming scenario leading to a 60% decrease in the number of natural snow-reliable ski areas. Artificial snow may be cost-effective for ski operators, but has environmental drawbacks: it consumes a lot of water and energy and affects the landscape and ecology, warns the report. French tour operators have already started to see cancellations in the Alps and Pyrenees this year, press reports say. Whether the market adjusts by cutting prices remains to be seen.

The report *Climate Change in the European Alps: Adapting Winter Tourism and Natural Hazard Management* will be released in February 2007. ■

For more information, contact Shardul.Agrawala@oecd.org

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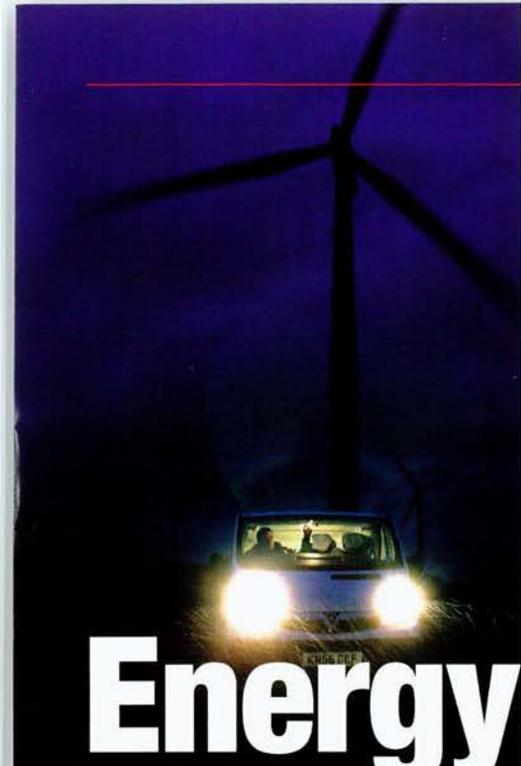
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* World Market Update 2005, BTM Consult ApS, Denmark

*Growth calculated over the last one year **Audited Results for FY 2005 - 2006

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Energy

Finding a new gear

Global warming, finite fossil fuels and geopolitical risks make a shift to renewable energies inevitable. Though it is a challenge fraught with uncertainties, no action would be worse. An alternative, workable energy strategy is within reach.

Is there a silver bullet to resolving the energy challenges of our time? The answer is no. To those who take refreshment in the heady ambrosia of wind farms and solar panels as the solution to the world's energy problems, such news may be disheartening. Renewable energy technologies as they exist now are simply incapable of meeting future energy needs. But the same also goes for protagonists of nuclear energy, as there is not enough fissionable fuel available even to supply all of today's electricity. There is also a message for conservationists and those worried about climate change: even in the best of scenarios, fossil fuels will still provide for the majority of our energy needs for some time to come.

Despite this rather simplistic outline, there is good news. We can change, as indeed we must. It will take time, effort and money, but new strategies are possible that would use energy in cleaner, safer, more cost-effective ways.

For now, we achieve the opposite on all scores. Our energy habits are unsustainable because they are dirty, wasteful and their consequences disastrous for the environment and even in some cases irreversible. This stark conclusion was spelt out by the International Energy Agency (IEA) in its 2006 edition of the *World Energy Outlook*, published in November. As the IEA's chief economist, Fatih Birol, puts it, "on its current course, the future global energy situation will remain vulnerable, dirty and expensive."

In other words, new policy strategies cannot afford to stay business-as-usual, but must make energy clean, clever and competitive. And it must address three problems: rising energy demand, security of supply, and carbon-dioxide emissions, a contributing cause of climate change.

The IEA report presents two scenarios, set within the timeframe of 2004-2030: one based on the likely evolution of current energy trends—a so-called reference scenario, and an alternative scenario that would result if policymakers adopted measures now being considered to develop an energy mix.

Global primary energy demand—which is to say, energy in its initial form, before exportation and refinement—is expected to increase by more than one-half by 2030, with over 70% of that demand coming from developing countries, 30% from China alone. Fossil fuels, such as oil, coal and gas will continue to provide most of this energy, and for good reason: fossil fuel is energy in an extremely compact form. Compared to the single watt generated from a square meter of biomass or 10 watts from wind power, the equivalent in fossil fuels generates 100 to 1,000 watts. Furthermore, many countries have ample reserves of these fuels.

Indigenous fuel reserves also dispel fears of supply disruption. Recent natural disasters such as hurricanes in the Gulf of Mexico, and

geopolitical events such as the gas dispute between Russia and Ukraine, civil unrest in Nigeria, nationalisation of hydrocarbons in Bolivia, and enduring conflict in the Middle East have all contributed to making energy security a priority.

But for many people, the main concern is carbon-dioxide emissions and their role in climate change. While arguments that climate change is a natural phenomenon in the earth's history are now widely dismissed as at least disingenuous, we cannot formulate measures with any degree of certainty as to their success simply because we have no precedent on which to base our decisions.

The recent Stern Review commissioned by the UK government predicts an average temperature increase of 2% by 2035 if nothing is done to reduce emissions, and that, over a longer period, there is a 50% chance that temperatures will rise in excess of 5°, a difference as great as from the last ice age until today. The consequences for physical and human geography would be enormous. Losses to GDP will reach about 5% per year, and in the worst case, 20%.

Right now, we are on our way to a 55% increase of CO₂ by 2030. Again, more than three quarters of these emissions will come from developing countries. Moreover, to complicate matters further, coal is back in fashion. "There seems to be a big comeback of coal," says Dr Birol. "One of the consequences is CO₂ will grow faster than energy demand."

It is now painfully clear that the emissions targets set in the Kyoto Protocol will most likely not be met. Nothing anyone does will have anything but a marginal effect on emissions before 2010. The reason is that emissions figures are volatile. Levels in the 1990s soared between 2000 and 2004; China alone more than doubled its output.

Yet if measures considered in the alternative scenario set out by the IEA are adopted, we can reduce emissions by 16% relative to the reference scenario. Capping emissions at their present level would require the implementation of *all* the measures considered, coupled with unprecedented technological innovation. In

short, this would require tremendous political will.

Policymakers should expect resistance. Governments may be hard-pressed to convince businesses of the urgency and necessity of implementing new measures, and must create incentives if they are to be followed. Since research and development occur primarily in the private sector, governments will have to provide a favourable environment for investment.

This is simply because investment will have to be massive. Up to \$20,000 billion will have to be pumped into energy infrastructures, with more than half directed to developing countries. Attracting such investment will not be easy. But if the measures in the alternative scenario are adopted, they should pay for themselves. When compared with the reference scenario, cumulative investment ends up being \$560 billion lower. Consumers save \$8,100 billion on fuel. If the economic gains outweigh costs, why should new policies be so difficult to implement?

First, we should remember that we are not facing an energy shortage. Prices are high, but fuel reserves are plentiful. Arguments that climate change is inevitable and cataclysmic have not persuaded everyone. Even if they did, immense difficulties remain. Renewable energy from wind farms and biofuels require large tracts of land, but in the highly populated world of 2030, most arable land will be needed to grow food.

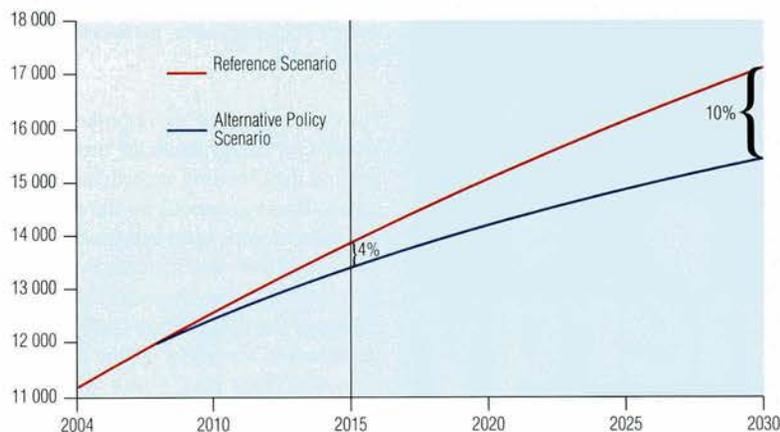
Public resistance to wind farms and nuclear power is well known, but resistance to efficiency? Improving efficiency is the cheapest and quickest way to meet energy demands, as it requires minimal investment in energy infrastructures. Yet from the consumer's point of view, efficiency is of minor concern when buying electrical appliances. And although car-buyers in the US and increasingly in Europe support efficiency in principle, mainly because of fuel prices, they still prefer larger cars because they believe smaller vehicles are less safe, less comfortable.

As one moves down the line from producer to consumer, more decisions are made by



Tough choice?

World primary energy demand in the IEA Reference and Alternative Policy scenarios, millions of tonnes oil equivalent (Mtoe)



Note: Over time, capital stock is added and replaced, boosting opportunities for the introduction of more efficient technologies. A reduction in the use of fossil fuels reflects more efficient technologies and switching to carbon-free energy sources. Nonetheless, fossil fuels still account for 77% of primary energy demand by 2030 in the alternative scenario, compared with 81% in the reference one.

Source: IEA

Our societies require ever more energy, and will get it by whatever means necessary. And that means smoke.

individuals than by corporations or committees, making them difficult to harmonise. Partial information about energy performance, lack of awareness about potential savings, and individual preferences and fears complicate the task of putting new measures into practice. Uncertainty about the feasibility or safety of certain technologies, such as carbon storage or nuclear waste disposal, does nothing to strengthen confidence in policies that promote their use. Whether we like it or not, policymakers are working—if not in the dark—at best in a dimly lit room; and it cannot be otherwise, because we have never before faced a challenge of this scope.

But if there is no smoke without fire, the converse is equally true, for our societies require ever more energy, and will get it by whatever means necessary. And that means smoke. Our present course, however, is unsustainable; should we ignore that fact, we face the possibility of upheaval. Fortunately, we have a choice.

For its alternative scenario, the IEA analysed more than 1,400 policies, each of them under consideration by various governments. None of them is merely wishful thinking. It was found that if just 12 of those policies were adopted, CO₂ emissions would drop by 40%.

For Dr Birol, decisions made in the next 10 years will be crucial for two reasons. First, in many OECD countries, power plants that were built just after the Second World War, when economic development took off, are about to retire. "The kind of technology we opt for now will be crucial to determine the next 50 years, because a power plant has a lifetime of 60 years," he says. The second reason is development, with major countries like India, China and others booming. This means more energy investment accumulating in those countries in the next 10 years. Dr Birol firmly believes the window for action is now: "If those investments are not done in a sustainable manner, then we will have to live with the consequences for the next 50 to 60 years, if not longer." ■ LT

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- Contact Fatih.Birol@iea.org



Oil change

Fighting global warming means reducing dependency on oil. But though supply is insecure, it remains plentiful. Keeping oil in the energy mix makes sense.

There is a vast, unexplored region where an estimated 30% of the world's oil lies buried, yet only 2% of the world's exploratory drilling is carried out there. Where is it? The answer is not Antarctica or under the Pacific, but the Middle East.

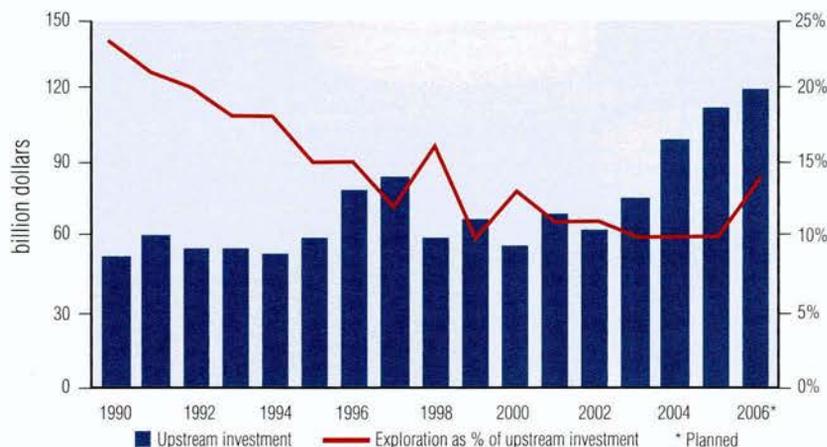
Surprisingly, the world's largest oil reservoir is under-exploited. Over the last 40 years, the number of wildcat wells drilled in the Middle East has plummeted, and today exploration is nearly zero. A number of reasons have contributed to the decline, from regional conflicts, two decades of low prices and the soaring cost of equipment. Elsewhere around the globe, the picture is similar, with the additional constraint of tough environmental controls affecting exploration and drilling. A company leasing a drilling rig in the North Sea can expect to pay a 100% higher rate today than it would have paid a few years ago, and up to 400% more for a rig in the Gulf of Mexico. This inflation results principally from the surge in demand, mainly from fast-growing economies. How long can these needs be met?

The *Oil & Gas Journal* estimates that the world's proven oil reserves stand at some 1,293 billion barrels, revising earlier estimates upwards by approximately 14.8 million barrels. But prices, for both producer and consumer, remain high. In 2005, a barrel of crude averaged around \$50, nearly four times the nominal price in 1998. Transportation is partly to blame, as oil is consumed principally by that sector. Globally, primary oil consumption is around 35% of total primary energy consumption, and it will only decline slightly to 33% by 2030, according to *World Energy Outlook 2006*. Oil's current contribution to global CO₂ emissions is 39%—of which the transport sector accounts for one-fifth. Add to this geopolitical uncertainties and it is little wonder governments are turning to biofuels as a way forward in developing a reliable energy mix.

The US Geological Survey estimates that the volume of undiscovered conventional resources is nearly 2,300 billion barrels. This is nearly twice the volume already produced (1,080 billion). And it is

Fossil futures

Oil and gas exploration investment



Note: Spending on exploration has risen in absolute terms since the beginning of the current decade, but declined as a share of total upstream investment until 2005. Includes Apache Corporation, BG Group, BP, Chevron, CNOOC, ConocoPhillips, ExxonMobil, Lukoil, Occidental, ONGC, PDVSA, Petrobras, Petro-Canada, PetroChina, Repsol-YPF, Sinopec, Statoil and Total.

Source: IEA

economically recoverable. Getting it out of the ground is the problem. Three-quarters of total industry investment goes "upstream," which is to say production, of which 90% goes into fuel development, and only 10% into exploration. New technology would help, but industry is cautious, since companies understandably prefer to use tried and true methods when tackling expensive new projects. In the WEO 2006 "Reference Scenario", about \$164 bn per year will need to be invested between 2005 and 2030, most of it directed to production to maintain present capacity.

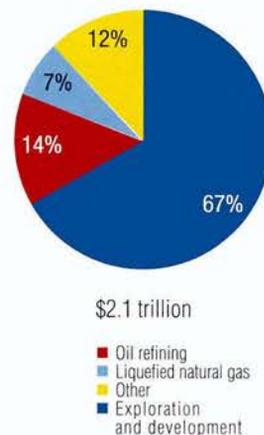
Even if massive investment for exploration is forthcoming, international companies face new hurdles. The unexplored basins around Greenland, in the Russian Arctic and deep-water Caspian are promising for large-scale investment, but their remoteness, harsh climates and lack of infrastructure means hefty capital investment. In the Middle East, Iraq is under-explored, but the current security risks are prohibitive. As pointed out in WEO 2006, oil and gas investments have surged in recent years,

OECD countries could save up to \$900 billion in oil imports by 2030, which is roughly the GDP of Canada.

driven by rising materials, equipment and labour costs.

Energy security concerns and public suspicion of multinational energy corporations earning supernormal profits on the back of the price surge has led to renewed interest in nationalisation. Some countries restrict foreign investment, others, including in the OECD, forbid it entirely. Venezuela, Bolivia and Russia have put reserves back into state hands. The high price of oil has so far not enfeebled the global economy, which may be taken as a sign of good health as today's robust marketplace now absorbs shocks of the kind that disrupted the oil industry in the 1970s and early 1990s. However, continued reliance on subsidies, notably in developing countries, cushions the consumer against price realities. This encourages waste. Subsidies also take

Total oil and gas industry investment by sector 2006-2010



\$2.1 trillion

■ Oil refining
■ Liquefied natural gas
■ Other
■ Exploration and development

Source: IEA

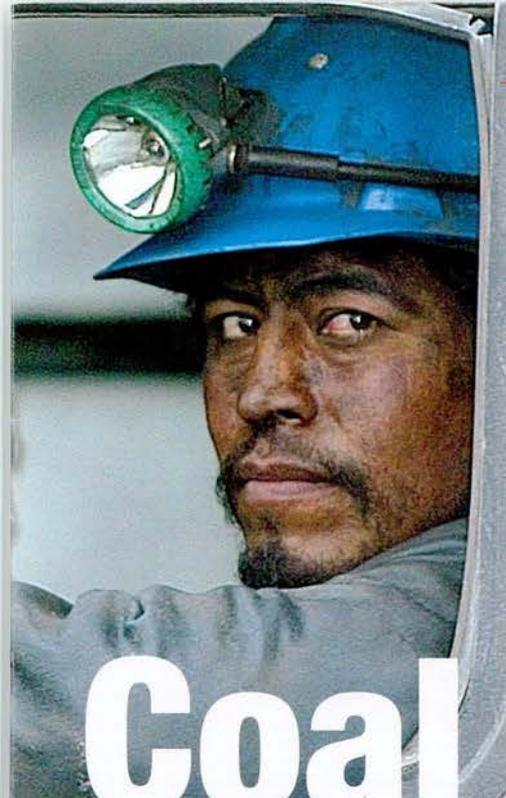
government funds that could be diverted to research in alternative energy or to energy initiatives for poorer countries.

Diversification of energy sources finds its strongest supporters among countries with high import densities. If OECD countries adopted the alternative energy policies proposed in *World Energy Outlook 2006* aimed at reducing dependence on imports and cutting greenhouse emissions, it could save up to \$900 billion in oil imports by 2030. That is roughly the GDP of Canada.

Oil is still a remarkable energy source, with enormous energy density and efficiency. Its relative use will have to decline if we are to curb carbon emissions, but keeping it within the energy mix will make good economic sense for several years to come. And that means more wildcat drilling, too. ■

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- For further information on oil projections at the IEA, contact olivier.rech@iea.org and david.lyfe@iea.org



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Coal faces the future

In OECD countries coal has a blackened image. Yet, it remains a key component of any energy mix. Innovation might help make that future brighter.

Coal was probably first exploited commercially in China, though one of the earliest known references to a coal-like product was made by Aristotle. Since the Industrial Revolution, which coal helped to spark, its qualities as an abundant and energy dense fuel have been proven. However, coal's recent history has a darker, dirtier side, as illustrated by London's legendary smog (a blend of fog and dusty smoke) that killed an estimated 12,000 people in 1952, and the acid rain that affected north European forests in the 1970s and 1980s.

Coal mining is also risky work; in China some 6,000 miners die every year in accidents. The safety record has vastly improved in the OECD area, and the US Chemical Safety Board reports that oil and

gas industry fatalities can be higher than in coal mining. Still, miner deaths like recent ones in Poland and the US grab the headlines and reinforce the dangerous image of the industry.

While many people may associate mining with pollution, hardened communities and a past socio-economic order, coal is still very much part of the present and the future. In fact, coal is the most abundant fossil fuel and accounts for around one-quarter of the global energy mix. Many countries have ample reserves, which means a secure supply. Though 80% of reserves are found in six countries—China, US, India, Russia, Australia and South Africa—more can be found spread around several others. Over half of electricity in the US comes from coal, as it does in Germany. Even in the UK, where mining has receded, coal accounts for 35% of electricity production, much of it imported from Russia. In Poland 93% of electricity comes from coal. In Japan the figure is 29%, reflecting a higher use of oil and nuclear power.

In the reference scenario of the IEA's *World Energy Outlook 2006*, coal's share in the global energy mix is projected to remain roughly constant over the next couple of decades. Countries like India and China—already the world's largest producer—will see the biggest growth. According to the *WEO 2006*, these two countries account for over three-quarters of the entire increase in coal use between 2004 and 2030. Over the next 25-30 years, the IEA anticipates a 59% increase, globally, in tonnes of coal burned, of which 81% will go to power generation.

In 2004 coal-fired power plants produced 40% of total world electricity output. High oil and gas prices have improved the attractiveness of coal-fired stations, with new more efficient generators being built or in the planning stage in the OECD. By 2030, the share of coal in electricity output will rise to 44% in *World Energy Outlook 2006's* reference scenario. Coal also plays an important, if diminished, role in the alternative policy scenario. Its share in power output falls to 37%, helping stem the rise in CO₂ emissions to 31% by 2030, compared with a rise of 55% under the reference scenario.

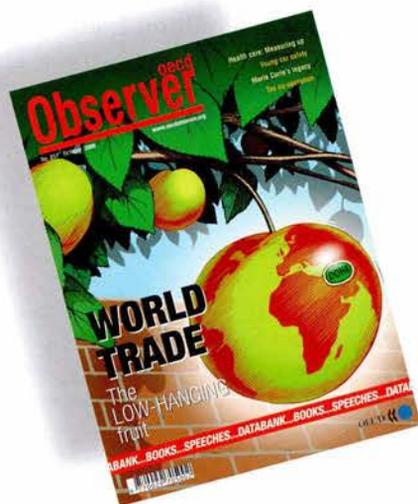
A large 1,000 megawatt coal plant may produce enough energy for 1.6 million homes but also produces some 6 million tonnes of CO₂ per year—the equivalent of 2 million cars.

This appetite will not exhaust reserves too fast: 20 countries have known reserves exceeding 1 billion tonnes, out of a global estimate of about 909 billion, which is enough coal to burn for 164 years. By 2030, at current rates, only 22% of those reserves will have been exhausted.

The main problem with coal is not reserves or price, but emissions. In fact, coal is a very dirty fuel. Effective controls from coal-fired power plants do exist, for sulphur (SO_x), for instance, and have led to reductions in acid rain. However, coal is the most carbon intensive of all fossil fuels. A large coal plant, generating 1,000 megawatts of energy may produce enough energy for 1.6 million homes, but it also produces some 6 million tonnes of CO₂ per year—the equivalent emissions of two million cars. As an IEA report notes, CO₂ control technologies have not been adopted yet. Incentives could be introduced for deploying technologies that lower, or even eliminate, these emissions, whether by mechanisms such as taxes or tradeable emissions permits.

As retrofitting old coal power plants is costly, the industry expects new plants to be equipped with technologies to improve efficiency and cleanliness. According to one report, some 150 new plants are on drawing boards in the US, with one firm unveiling plans to build 11 in Texas alone. Average efficiency of today's plants is about 35%, and new designs can improve that to around 46%, experts believe. Innovations are in the pipeline to make coal cleaner. Washing coal to remove impurities, filtering smoke for particles or adding some biomass do not deal with the greenhouse gas emissions effectively enough.

One promising way to deal with carbon dioxide is to siphon it off. There are various methods of this so-called CO₂ capture, and



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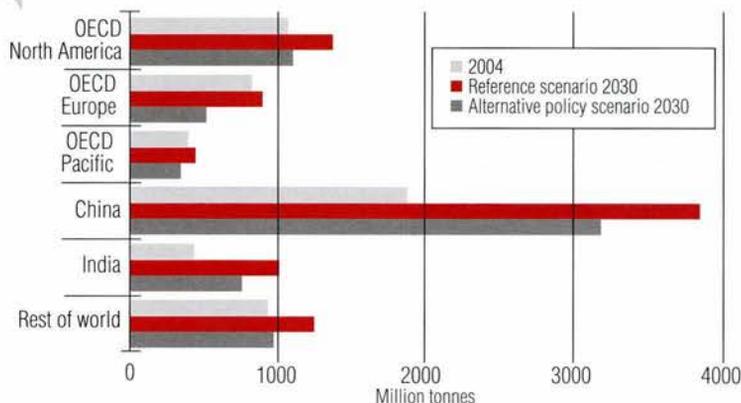
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Coal comfort

Coal demand in the WEO reference and alternative policy scenarios



Source: OECD/IEA, 2006

this all adds to costs. Paradoxically, it also means mining and burning more coal to provide the energy needed to extract the CO₂.

Still, capture-ready plants are now being built. Carbon capture basically means storing unwanted carbon dioxide indefinitely, say, by injecting it deep into geologic formations. A report by the Intergovernmental Panel on Climate Change (IPCC) estimates that the earth's technical storage capacity is at least 1,700 Gigatonnes and perhaps as much as 10,000 Gt of CO₂.

Much of the public interest in storage surrounds the risk of leakage. While small amounts of CO₂ are harmless, a massive outpouring would be lethal. However, while sudden carbon dioxide releases can happen naturally, in volcanic activity for instance, the chances of these occurring in the context of carbon capture storage are virtually nil. If there is a debate, it is less about safety risks than the possibility of greenhouse gases re-escaping back into the atmosphere and so undermining the investment. In practice, tests show that leakage is highly unlikely to happen. For a start, the CO₂ is injected beneath impermeable cap rock, which would be monitored for faults. Also, unlike in a volcanic situation, the carbon dioxide is not a pressurised gas, but is introduced as a liquid-like medium which is then absorbed like a sponge deep in bedrock pores that had already locked oil and gas safely away for

millions of years. Much of the carbon dioxide would dissolve over time into surrounding saline water or become permanently trapped in rock.

Commercialisation of large-scale capture and storage technology is still a decade away, but tests in the Sleipner sub-sea storage site in Norway, which stocks some 10 Mt of CO₂, have been positive (see Norway, ministerial roundtable, page 6).

Vigorous investment in cleaner coal technologies and competitive renewable technologies may help alter emissions scenarios, but whether we like it or not, the history of coal as part of our planet's energy mix is far from over. ■

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Nuclear energy

Towards sustainable development

Luis E. Echávarri

Director-General, OECD Nuclear Energy Agency (NEA)

OECD countries share the same goals of sustainable development, but differ in their views on the role of nuclear energy in achieving those goals. Indeed, few energy sources have been scrutinised in the public spotlight over the years quite as much. The question is simple: is nuclear really a sustainable energy?

There is good reason to believe it is, but that does not mean all the challenges have been resolved. If they had, nuclear energy's value would be beyond debate. Still, some member governments of the OECD that have historically been sceptical are now giving nuclear energy a hard look. They are right to do so.

Like any other energy source and technology, nuclear energy has advantages and drawbacks in each of the three dimensions of sustainable development: environmental, social and economic. Policymakers must have authoritative facts, figures and analyses to support their decisions on energy choices. The Nuclear

Energy Agency can provide expertise and help governments assess nuclear energy on a level playing field, with alternatives.

The political consensus nowadays is to encourage an energy mix, with different sources of supply playing a role. This makes sense if we are to meet the growing demand for energy needs, not least in rapidly growing developing countries, and to preserve our environment. Cleanliness, security of supply, efficiency, affordability: these are the key energy challenges we face.

These challenges also point to the attraction of nuclear energy and help explain renewed public interest in it. Nuclear power is a nearly carbon-free electricity generation source, with a large and diversified fuel resource base. There is a general recognition that nuclear energy is part of the solution, together with renewable energy sources, carbon capture and sequestration, and the like. Consider some of the arguments more closely.

One of the advantages enjoyed by nuclear power plant operators is **security of supply**. Uranium, the natural material for

fuelling nuclear power plants, is plentiful and well distributed across the planet. Although, at present, annual uranium production provides only some 60% of reactor consumption, secondary sources, such as inventories of producers, utilities and governments, and ex-military materials, are sufficient to cover demand. In addition, the geopolitical distribution of uranium producers, which include such countries as Australia and Canada, greatly reduces the risk of the kind of market disruptions experienced during oil crises, for example.

In the long term, we are confident that ample natural resources and progress in technology can ensure nuclear fuel supply, whatever the development of nuclear energy may be. Conventional uranium resources represent 270 years of present annual consumption. Other resources are known to exist and could be made available with further exploration and development efforts. Moreover, the introduction of advanced reactors and fuel cycles could multiply the lifetime of those resources by 30 or more and allow for a sharp rise in demand. Indeed, breeder

Geographic distribution of uranium resources



Based on data from *Uranium 2005: Resources, Production and Demand* (OECD/NEA, Paris, 2006).

reactors could eventually make nuclear energy a quasi-renewable source.

There are **economic arguments** too. The competitiveness of existing nuclear power plants has been proven. Low and stable marginal production costs are a key advantage, particularly in liberalised markets. Fuel cycle costs represent less than 20% of the total cost of generating nuclear electricity, and uranium, despite recent sharp price rises, still accounts for less than 5% of the total. This is considerably lower than for gas, for instance.

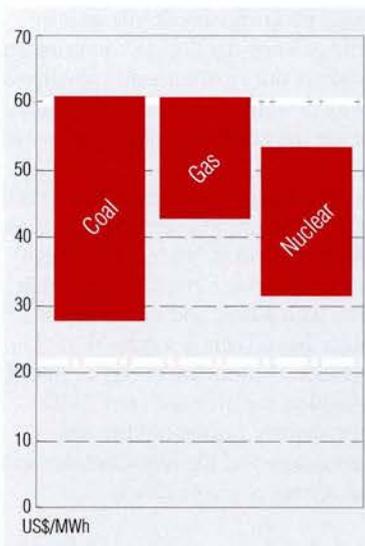
Recent studies have shown that new nuclear power plants can compete favourably with alternatives, generally gas- and/or coal-fired plants, in most countries (see graph). The main factors that contribute to the competitiveness of nuclear power plants, based on new designs that may be ordered today, include cost-effectiveness of the concepts, and enhanced technical performance such as longer lifetimes, higher energy availability and better fuel utilisation. The advanced light water reactors currently available on the market are designed for 60 years of operation at an average availability factor above 90%. They are designed to make better use of the energy content of natural uranium and to generate some 15% less waste.

Obviously, rising prices of fossil fuels reinforce the competitiveness of nuclear-generated electricity. Furthermore, the pricing of carbon emissions in the costs of fossil-fuel burning, through tradeable permits and taxation for instance, will increase the competitive margin of energy sources that emit no or very little carbon.

While the economic sense of nuclear energy is no longer an issue, financing the building of nuclear power plants and fuel cycle facilities remains a challenge. Recent decisions in Europe to build new plants suggest greater interest from investors but they remain cautious about the long-term financial risks. To reassure them, governments must at least provide stable regulatory frameworks in the field of nuclear safety and radiation protection, and

Competitive edge

Range of electricity generation costs in US\$/MWh for coal, gas and nuclear power plants, at 10% discount rate to reflect capital investment costs



Source: NEA/IEA, 2005

Rising prices of fossil fuels reinforce the competitiveness of nuclear-generated electricity.

back this up with clear policies to limit greenhouse gas emissions.

In parallel with technical improvements, addressing public concerns about nuclear risks is a high priority. **Safety** is of paramount importance in this regard. The excellent safety records of nuclear power plants and fuel cycle facilities in operation in OECD countries demonstrate the effectiveness of stringent regulations in place and of the efforts by industry and regulators to implement a robust safety culture. As a result of these efforts and progress in technology, the impacts of nuclear energy facilities on human health and the environment are well below the levels imposed by regulators and accepted by society in general for industrial activities. Going beyond mere compliance, the radiation doses received by workers in

nuclear installations have been more than halved over the past 20 years. Meanwhile, the strictly monitored radioactive releases surrounding nuclear power plant sites remain extremely low (typically between a tenth and a hundredth of natural background radioactivity), and are decreasing further still.

Another main concern to address is that of **waste management and disposal**. Although radioactive waste management, including final disposal, does not raise any significant technical or economic problems—it is essential to note in this regard that the cost of waste management and disposal is already integrated in the price paid by consumers of nuclear electricity—establishing repositories to hold all waste types for a considerable time has proven to be a challenge. However, experts agree that the safe disposal of radioactive waste is feasible, with due respect being given to health and environmental regulations protecting present and future generations. Advanced studies and demonstration projects have been carried out on the treatment, packaging and disposal of the waste in deep geological formations. These provide confidence that the successive natural and engineered barriers will satisfactorily isolate waste from the biosphere for as long as its level of radioactivity requires. Several countries, such as Finland, Sweden and the United States, are in the process of developing repositories that should be opened within a decade or so.

A proven case

Today nuclear energy provides nearly one quarter of the electricity consumed in OECD countries and is a daily fact of life in several of them. This has enabled it to become a proven, mature technology benefiting from broad industrial experience—more than 12,000 reactor-years of operation—accumulated mainly in OECD countries. State-of-the-art nuclear energy systems in operation worldwide have demonstrated highly satisfactory technical and economic performance. Moreover, extensive R&D programmes under way in many countries, often as part of international endeavours,

aim to make even more progress to enhance safety and proliferation resistance, to reduce uranium consumption and waste and to increase the competitiveness of nuclear energy.

In short, all nuclear energy indicators of safety, reliability, competitiveness and efficient use of natural resources, as well as health and environmental protection, show a continuous trend of improvement. Clearly, nuclear could make a major contribution to diversification, security of energy supply and the reduction of greenhouse gas emissions in a cost-effective way. Nuclear energy development can become a key part of sustainable energy mixes provided governments, industry and civil society work together to lay out a robust policymaking framework for all options to be assessed and developed

Today nuclear energy provides nearly a quarter of the electricity consumed in OECD countries. It is a daily fact of life.

according to their respective costs and benefits for society. That includes cooperating multilaterally to ensure the technology does indeed develop to the highest standards possible in the fields of safety and reliability, health and environmental protection, proliferation resistance and physical protection, and economics.

The challenges facing policymakers in the energy field are enormous. Energy efficiency and savings, carbon sequestration, renewable sources and nuclear energy are needed to meet the demand of growing populations and economic development while protecting the environment. We cannot afford to forego any option. ■

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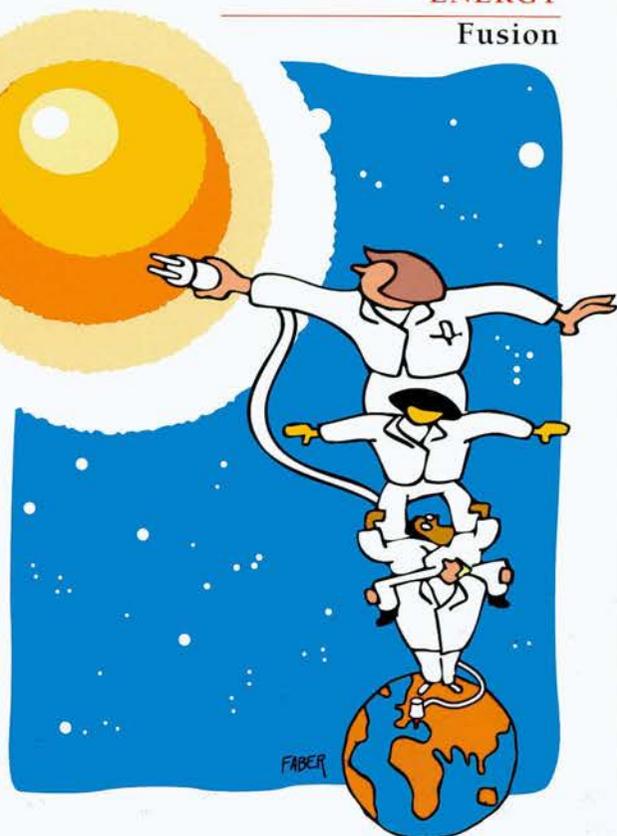
ITER late than never?

Could nuclear fusion solve the world's future energy problems? Scientists believe it could. Experiments have been taking place for years to show how a fusion reaction, rather than splitting a nucleus in the way fission does, forces two atomic nuclei together to form heavier ones. That process releases energy.

Fusion is a promising technology. Like nuclear fission, it would emit no CO₂. However, the waste generated would be benign. Moreover, its fuel is abundant—deuterium, a hydrogen isotope found in seawater, would fuse with tritium, a short-lived isotope that can be derived from plentiful lithium. Above all, by imitating the energy reactions that drive the sun, fusion promises a plentiful power supply as well.

The trouble is, reactions rarely last more than a few seconds and experiments have not been on a large enough scale to test its potential as a source of controlled power.

Enter ITER. Short for the International Thermonuclear Experimental Reactor, the project involves building an immense scientific research and demonstration facility at Cadarache in southern France. As with any major scientific undertaking with such high stakes and costs, international politics has taken a lead role. In fact, though the ITER idea was first mooted between Russia, France and the US in the 1980s, an agreement to establish the organisation that will oversee the project was signed only recently, on 21 November 2006, by Korea, Japan, the US and the European Commission—all four are OECD members—and China, India and Russia.



The Cadarache device is based on the Russian "tokamak" concept, by which gas will be confined in a chamber using a magnetic field and heated to enormous temperatures. The aim is produce 500 MW of fusion power.

Though there is no radioactive waste from fusion, the walls of the chamber remain contaminated for several years. Still, fusion reaction is considered safe mainly because there is only ever enough fuel in the chamber to sustain the reaction, and so is easily interrupted.

The ITER plant is expected to be ready by 2016 and will operate for 10 years before being decommissioned. The goal is "to demonstrate the scientific and technological feasibility of fusion power," so the Cadarache station will not generate power for outside use.

For Fatih Birol, chief economist at the International Energy Agency, though ITER is a fantastic project, nuclear fusion is not a policy option yet. "One day it may succeed to become part of an energy mix, but when? In today's context of global warming, even 50 years is a long time." ■ RJC

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Renewable promise

Can our insatiable appetite for energy be met efficiently and cleanly by renewable sources?

Global electricity demand is growing rapidly. Demand for transport energy is also rising. Renewable energy is as yet not capable of matching the energy-density of fossil

fuels, and it absorbs a lot of land, whether for cultivating biofuels or laying out solar panels. From solar to hydro, renewable sources are also unevenly distributed and supply can be irregular (see article by Vaclav Smil).

Nevertheless, technology and know-how are improving and renewable energy sources have already started to contribute more to the overall energy mix. Together with policies and other developments on the demand side, in

business and households, these could make for a healthier outlook for 2030.

The main renewable energy sources are hydropower, biomass and waste, wind, geothermal, solar, and tide and wave-generated energy. Hydropower and biomass are the most exploited sources today and the use of wind power is growing fast. In 2004, these renewables, including biofuels for transport, accounted for around 13% of total world primary energy demand.

The impact on electricity generation is noteworthy: renewables in 2004 accounted for some 18% of total terawatt hours generated and, according to the IEA's *World Energy Outlook 2006*, will account for 21% in 2030 on current policies. With extra investment and stronger policies and measures, that share rises to 26% in the report's alternative policy scenario, and could climb even higher.

Hydropower accounts for most renewable electricity generation, with a 16% share of total power generated in 2030, compared with less than 10% for all other renewable sources. Some hydropower is under-exploited, with only a third of potential now tapped globally. Extra expansion could take place in the developing world. But capacity constraints mean hydro's share in total electricity supply in the IEA's alternative scenario for 2030 would not increase much, even if new policies are adopted. The contribution from other renewables would be nearly eight times higher than now, thanks in large part to an expansion in wind power and biomass. Wind's contribution in the alternative policy scenario rises by over a fifth compared with the IEA's business-as-usual reference scenario.

In fact, such is the room for efficiency improvements in energy use that we could achieve far more from less. Overall electricity generation would be 12% lower in the alternative, yet quite-feasible scenario for 2030 than under a business-as-usual outlook if measures were adopted on the demand side, from

fitting better light bulbs to improving house and office building construction. The share of oil, for instance, slides from 7% of electricity generation in 2004 to 2.9% in 2030.

These projections are realistic. The costs of research and development into improving technologies are high, but will fall as technology improves. This is already happening in the solar and wind markets, and in its alternative policy scenario, the 2006 *WEO* puts the investment cost of solar photovoltaic energy in 2030 at less than half the current figure. As over a quarter of new power-generating capacity will come from renewables, the cost of development is expected to reach \$2,300 billion (in year 2005 dollars), or nearly half of power generation investment in the next 25 years.

There are limits to the promise of renewables, though. For one thing, developing countries will most likely be unable to use renewable alternatives on a large scale to leap-frog conventional energy sources such as coal to supply their future needs, unlike what some countries have been able to do in telecommunications with mobile phones, for instance. But renewables will still permit a better energy mix and could reduce usage of some of the less healthy forms of biomass, such as wood and charcoal burned in inefficient stoves, which the IEA points out kills nearly 2 million people every year. In any case, rapid economic growth in countries like India and China requires energy densities beyond the present scope of renewables. Both are starting to develop policies on renewable energy, in part to help curtail pollution.

How clean?

While renewable energy is relatively environmentally friendly, it does leave a footprint. Its appetite for land is striking, even if conventional energy installations, like pipelines and oil refineries, also take up space. Biofuel production may mean fewer food crops, which in an age of rising populations could pose problems.

Also, corn-based ethanol is particularly draining on soil quality and water resources. But while biofuels can achieve cleaner air by cutting emissions, as in Brazil, hybrid mixes are also to be found in "gas guzzlers" whose CO₂ emissions remain high compared with other vehicles.

As for hydroelectric power, even this emits large quantities of CO₂ and methane after a reservoir is initially flooded and submerged vegetation decays with changing water levels. Over time, new vegetation is engulfed and decomposes without oxygen, generating methane which the dam's turbines churn up into the atmosphere. The effect of methane on global warming is 21 times stronger than that of carbon dioxide. Also, though we know the environmental costs of burning fossil fuels, the side-effects of new energies are not fully understood. The impacts on local habitats or vegetation, or even climate patterns, of solar or wind power installations are still being documented. As tantalising and clean as it may be, renewable energy will probably not deliver a perfect world.

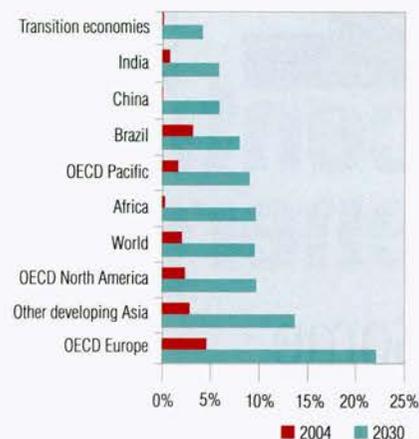
Still, renewable energy is in vogue, stimulating exciting expectations and business opportunities, not to mention high stock values. As ever, the countries with the right business frameworks seem to be benefiting first. In the UK, where renewable energy has received early political support, the London Alternative Investment Market (AIM) already lists 20 companies with a combined market

Renewable energy is a promising technology, but hype should be resisted.

value of nearly £1.5bn (\$2.9 bn). Wind and solar are attracting large corporations, too, including automotive and energy companies. British Petroleum (BP) says it intends to invest \$1.8 billion in solar photovoltaic cells over the next three years. This is good news for the energy industry and small innovative firms, as

Healthy option

Shares of non-hydro renewable energy in electricity generation by region in the WEO Alternative Policy Scenario



Source: IEA

well as for spin-offs in engineering, construction and conventional technology. Expect new companies to emerge and challenge incumbents, particularly large and unwieldy network providers, as lighter technologies bring energy supply to more local, flexible levels. Enabling regulation will be important.

Renewable energy is a promising technology, but as we warned in 2001 when dot-coms were expanding, hype should be resisted. The last e-bubble ended in tears. Global warming means it is in everyone's interest for a new e-economy based on renewable energy to take hold and stay a steady course. ■ *LT/RJC*

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- For further information on renewables in the IEA's *World Energy Outlook*, contact Maria.Argiri@iea.org and Piotr.Tulej@iea.org

21st century energy

Some sobering thoughts

Vaclav Smil

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Transition to new energy sources is unavoidable, but here are five sobering first principles to remember along the way.

Are we about to switch to new energy sources? Grandiose plans are being drawn up for installing veritable forests of giant wind turbines, turning crops and straw into fuel ethanol and biodiesel, and for tapping solar radiation by fields of photovoltaic cells. As with most innovations, there is excitement and high expectation. Will these developments and other renewable energy conversions one day replace fossil fuels? Eventually they will have to, but a reality check is in order.

An impartial examination of some basic principles reveals five factors that will make the transition to a non-fossil world far more difficult than is commonly realised. These are: the scale of the shift; the lower energy density of the replacement fuels; the substantially lower power density of renewable flows; and uneven distribution of renewable energy resources.

Consider the **scale of the shift** first. We are now at a point in time comparable to 1850, which marked the outset of the last great energy transition. Then, about 85% of the world's total primary energy supply (TPES) came from biomass fuels. In 2005 about 85% of the total supply originated from fossil fuels. By the late 1890s, when fossil fuel consumption rose to equal the biomass contributions, each of them supplied about 0.7 TW (Terawatts or 10^{12} watts); today, even if we were to replace only 50% of all fossil fuels by renewable energies during the coming decades, we would have to displace coal and hydrocarbons flows of about 6 TW. That is an enormous shift.

Today there is no readily available non-fossil energy source that is large enough to be exploited on the requisite scale. True, energy carried by solar radiation is several orders of magnitude larger than any conceivable global energy demand (see graph 1), but so far, practical conversions into electricity (using photovoltaics) or large-scale industrial heat are quite negligible. Also, other renewable energy flows could not cover today's worldwide total primary energy supply, even if, economics aside, they were fully exploited by current techniques. And even nuclear power's contribution is constrained by limited fissionable material.

The amount of energy contained in a unit of fuel, or **energy density**, is our second key consideration. In the last two energy transitions, from biomass to coal and then from coal to hydrocarbons, lower energy-density fuels were supplanted by more concentrated sources of energy. Air-dry crop residues (mostly straw) contain only 12-15 megajoules per kilogram (MJ/kg), for instance, whereas the energy density of good quality coals is twice as high, at 25-30 MJ/kg; that of crude oil is around 42 MJ/kg. To

achieve an equivalent output, a return to solid biofuels would require an average of nearly 3 kg of phytomass in order to replace a unit of fossil fuels; the ratio would be about 1.5 when substituting petrol by plant-derived ethanol. These realities would be reflected in the extent, cost and operation of the needed infrastructures.

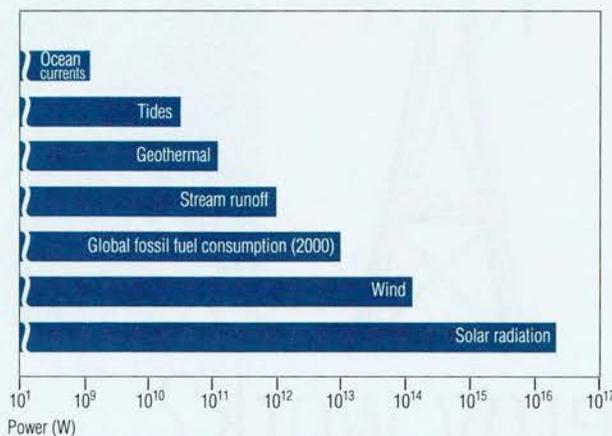
Power density of energy production is a third consideration. Power density refers to the rate of energy production per unit of the earth's area and is usually expressed in watts per square meter (W/m^2). Thanks to the lengthy periods of their formation, fossil fuel deposits are an extraordinarily concentrated source of high-quality energy and are commonly produced with power densities of 10^2 or $10^3 W/m^2$ of coal or hydrocarbon fields and hence only small land areas are needed to supply enormous energy flows. In contrast, biomass energy production has densities well below $1 W/m^2$, while densities of electricity produced by water and wind are commonly below $10 W/m^2$. Only photovoltaic generation, a technique not yet ready for mass utilisation, can deliver more than $20 W/m^2$ of peak power.

The energy supply chain of today's fossil-fuelled civilisation works by producing fuels and thermal electricity with power densities that are one to three orders of magnitude higher than the common power densities with which our buildings, factories and cities use commercial energies (see graph 2). In a future solar-based society inheriting *today's* urban and industrial systems, we would harness various renewable energies with at best the same power densities with which they would be used in our dwellings and factories. Consequently, in order to supply a house with electricity, photovoltaic cells would have to cover the entire roof. A supermarket would require a photovoltaic field roughly ten times larger than its own roof, or 1,000 times larger in the case of a high-rise building. In other words, a transition to renewable energy would greatly increase the fixed land requirements of energy production and would also necessitate more extensive rights-of-way for transmission.

By far the greatest land requirements in such a solar society would arise if we were to

1. Energy potential

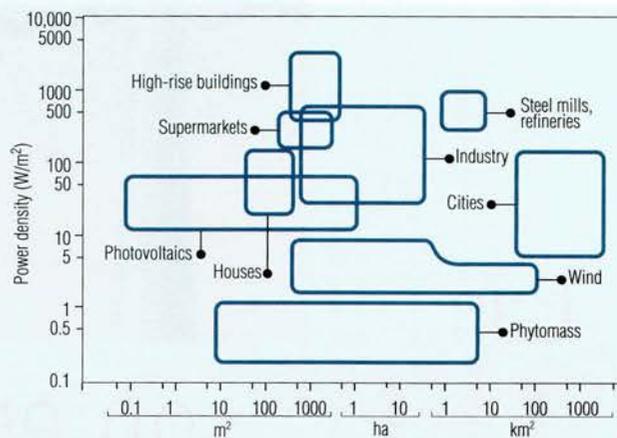
Global flux of renewable energies vs. fossil fuel consumption



Source: V. Smil

2. A new scale

Comparison of power densities of energy consumption and renewable energy production



Source: V. Smil

replace all crude oil-derived liquid fuels with phytomass-derived biofuels. Production of US corn ethanol has a power density of just 0.22 W/m²; that means that more than twice the country's entire cultivated area would be needed in order to satisfy the country's demand for liquid transportation fuel!

Intermittency of supply is our fourth reality check. Modern societies are dependent on massive incessant flows of energies; growing demand for fuels and electricity fluctuates daily and seasonally, but the base load—which is the minimum energy needed to meet the needs of the day—has also been increasing. Easily storable high-energy density fossil fuels and thermal electricity generating stations operate with high load factors (>75% of the year for coal-fired stations, > 90% for nuclear plants) and so can meet these needs. In contrast, because wind and direct solar radiation are intermittent and far from predictable, they can never deliver such high load factors. PV generation is still so negligible that it is impossible to offer any meaningful averages, but annual load factors of wind generation in countries with relatively large capacities, such as Denmark, Germany and Spain, are just 20-25%: large wind turbines are thus idle for an equivalent of 270-290 days a year! Also, an unexpected drop-off in generation can cause sudden supply

interruptions. Unfortunately, we still lack the means to be able to store wind- or solar-generated electricity on a large scale.

Geographical distribution is the final sobering consideration. Much is made of an uneven distribution of oil and gas, but renewable flows are also spread out unevenly: cloudiness in the equatorial zone reduces direct solar radiation; whole stretches of continent have insufficient wind; there are too few sites with the best potential for geothermal, tidal or ocean

Today there is no readily available non-fossil energy source that is large enough to be exploited on the requisite scale.

energy conversions, etc. In fact, some densely populated regions have no significant locally available sources at all and many reliably windy or sunny sites are far from major load centres, which means their exploitation would require entirely new mega-infrastructures.

Three key factors drove the 19th century transition to fossil fuels: declining resource availability (deforestation), higher quality (higher energy density, easier storage, greater

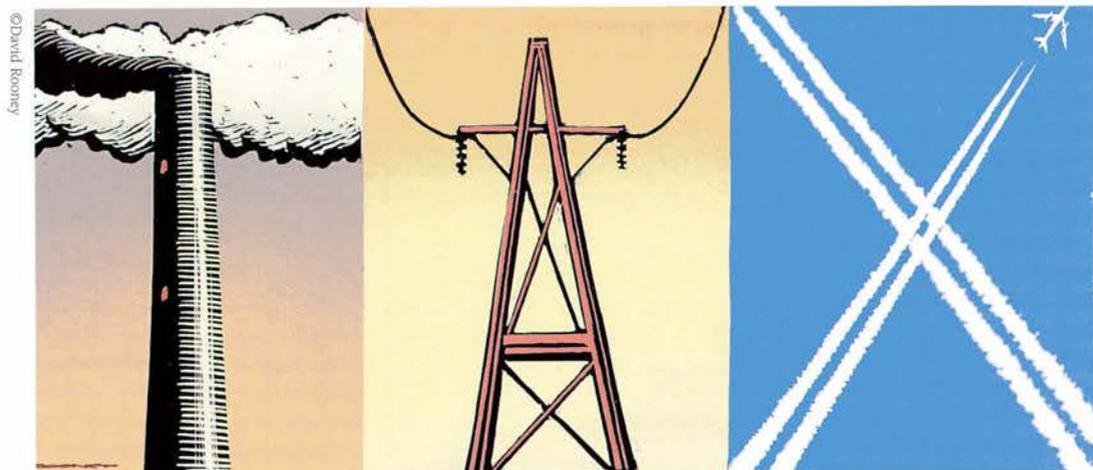
flexibility) and lower cost of coals and hydrocarbons. On these three points at least, there is no urgency for an accelerated shift to a non-fossil world: fossil fuel supplies are adequate for generations to come, new energies are not qualitatively superior, and their production will not be substantially cheaper.

Arguments for an accelerated transition to a non-fossil world are predicated almost entirely on concerns about climate change. Even then, because of the enormity of requisite technical and infrastructural requirements, many decades will be needed to capture substantial market shares on continental or global scales. A non-fossil world may be highly desirable, but getting there will demand great determination, cost and patience. ■

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Can Taxes on energy work?

Can taxation help governments achieve environmental goals with respect to energy use and emissions? Yes, with conditions.

A recent OECD report, *The Political Economy of Environmentally Related Taxes*, argues that taxation already provides a useful environment policy instrument, but that its use could be made more effective in disciplining demand. In fact, environmentally related tax revenues represent some 2-2.5% of GDP in the OECD area, though the rate varies widely from country to country. The largest number of environmentally related taxes is levied on energy products (150 taxes) and motor vehicles (125 taxes).

The effectiveness of energy taxes could be further improved if exemptions were scaled back and the rates of taxation were brought into line with the amount of environmental damage being caused. More international co-ordination would help, too.

There are two main barriers to taxing energy more widely. The first is a worry that taxation of this type, if not applied in a wide spectre of countries, will lessen the international competitiveness of some energy-intensive sectors and may lead to losses of revenue and jobs. On the other hand, closing down subsidised loss-making polluters could be a low-cost way for governments to reach environmental goals, the report notes.

The second policy concern is that additional energy taxes, for heating fuel for instance, could hit poor people and pensioners disproportionately. The effects of additional energy taxation on low-income households can be mitigated or compensated by measures such as targeted tax allowances and credits. For example, in 1996 the Netherlands introduced a regulatory energy tax (RET) on the use of natural gas and electricity. The RET rates were later raised progressively, while at the same time the tax rate in the first bracket of personal income tax (PIT) was reduced in step with the RET increases.

In some instances though, concern over effects on income distribution deters governments from imposing energy taxes on households. For example, households

have been excluded from the UK's climate change levy because of the government's commitment to tackle fuel poverty.

So far as the competitiveness issue is concerned, there is in fact little evidence that environmentally related taxes have had much impact on particular sectors. However, this is in part due to the fact that energy intensive industries are characteristically exempted. Indeed, the comprehensive OECD/European Environment Agency database shows that the largest number of exemptions is linked to "manufacture of coke, refined petroleum products and nuclear fuel", reflecting exemptions for fossil fuels produced by this sector. A high number of exemptions is also linked to "manufacture of motor vehicles, trailers and semi-trailers".

Imposition of additional taxes on energy-intense sectors is often politically sensitive. For instance, aviation fuel is exempted from taxation and any change in the current situation seems out of the question, particularly on international flights. Nonetheless, the European Commission is now considering ways to address this issue on flights within the EU. In addition, the International Air Transport Association is looking at the wider picture, partly because of environmental concerns.

The challenge is how to persuade as many countries as possible to put similar policies in place.

As *The Political Economy of Environmentally Related Taxes* notes, under the Kyoto Protocol most OECD countries have legally binding and quantified obligations to limit emissions of greenhouse gases. This has already contributed to new policy initiatives in several countries. The evolving CO₂ emissions trading scheme in the EU is an example which obliges the power sector and selected industries to hold emission allowances for the CO₂ emissions they cause.

One approach to improve effectiveness is to recycle part of the tax revenues back to affected firms, even if case studies carried out by the OECD show that this partially undermines the primary objective of reducing emissions. Another possibility is to adjust border taxes, such as import and export levies, to even out price distortions caused by country differences in environment tax levels. However, the free trading rules under the World Trade Organization can make this approach problematical.

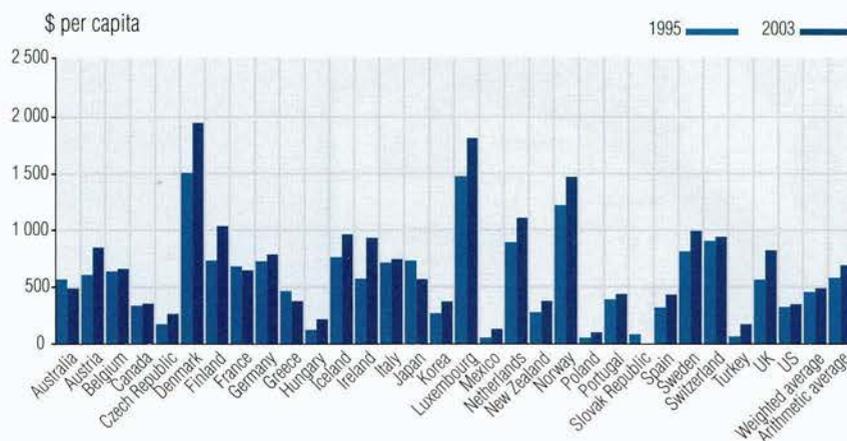
Revenues raised from energy taxes do not have to be earmarked for environmental purposes in order to be effective. Their mere imposition should encourage businesses and other taxpayers to favour more environment-friendly alternatives. In practice, many taxes on motor fuels are channelled into road building. This may sometimes be good for the environment—for example by relieving congestion—but in other instances it may add to the problem. Alternatively, revenues of this type can be used for more general purposes, such as strengthening budget balances, increasing public investment, or reducing other taxes or social security contributions.

Is there an “optimal” tax rate on motor fuel? This is not at all easy to define, the report warns, suggesting that ideally, the tax rate on motor fuels should—as for other tax-bases—reflect the size of the negative environmental effects, or externalities, each fuel causes. If any revenues raised are used to lower other, more distorting, taxes, then so much the better.



Greener taxes?

Revenues from environmentally related taxes per capita, 1995, 2003



Source: OECD (2006), *The Political Economy of Environmentally Related Taxes*

Revenues raised from energy taxes do not have to be earmarked for environmental purposes in order to be effective.

Generally speaking, energy and other environmentally related taxes can work well in combination with other regulatory instruments, voluntary agreements and other procedures to help achieve their goals. The report explores several examples, including Denmark's initiative to combine CO₂ taxes with agreements on improved energy efficiency in industry, with tax revenues being recycled back to participating industries, such as via other tax cuts.

Overall, as in all good policymaking, two features are vital for success: **coherent policy goals** that are clearly stated, and a good **public understanding** and acceptance of the need for action and of the measures that are being adopted. One example of incoherence cited in the report is the tax rate on diesel, which in most countries is much lower than the rate for petrol. This is regrettable from an environmental point of view, the report's

authors say, since diesel-driven vehicles cause more local air pollution and noise than petrol-driven vehicles. Keeping the tax low as an incentive to buy into the energy-efficiency qualities of diesel-driven vehicles is not an argument, the report says, since that benefit is already “internalised” in the lower running costs of the car.

The message is that taxes can help in the fight against global warming and to alleviate other environmental problems, as long as they are properly and coherently applied. ■ RJC

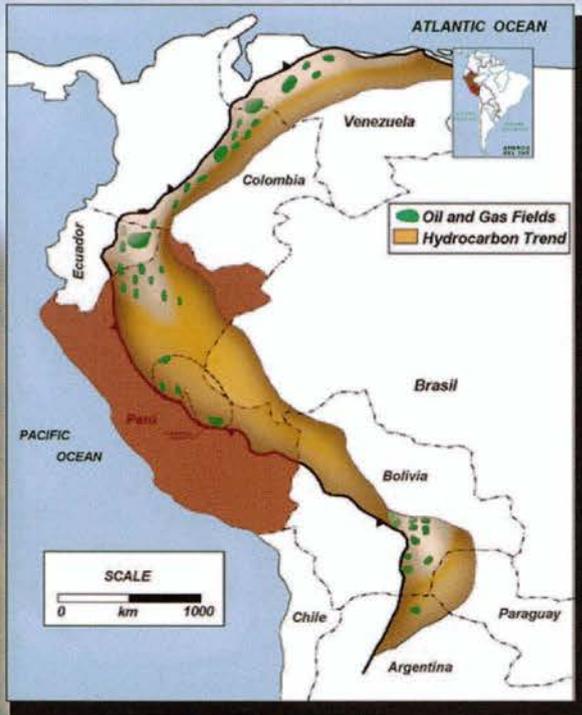
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The OECD Observer would like to thank Lorcan Lyons and Pawel Olejarnik for their assistance in compiling this Energy Focus.



PERU is part of the Sub-Andean Hydrocarbon fold-thrust belt, with still high potential for new exploration.



December 2003
Contracted Area : 19.6 million acres



Contract Stability
No Signature Bonus
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Poland's first 10 years

Jarosław Kaczyński,
Prime Minister of Poland,
greeted Secretary-General Gurría

“One of the most remarkable transitions in modern history,” is how Secretary-General Angel Gurría described Poland’s accomplishments since the end of the Cold War, in a special address at a conference celebrating 10 years of Polish membership of the OECD held in Warsaw on 23 November 2006. At a time when the OECD is discussing enlargement, “we still very much have the example of Poland in mind”, the secretary-general said.

Mr Gurría briefly retraced Poland’s modern history, its emergence from communism and subsequent structural changes. Joining the OECD in 1996 helped Poland to integrate itself into global policymaking circles and to

gain access to the experience of other OECD countries. “Poland was also a potent symbol of a changing world,” Mr Gurría argued, pointing to other central European countries, Korea and his own home of Mexico as other examples of countries that joined the OECD at around the same time.

The secretary-general outlined Poland’s progress: its robust growth rate—some 4% per year since 1995—a skilled workforce, and high foreign investment. The number of students in higher education is nearly five times what it was in 1991, and with education investment, “Poland is laying the foundations for future growth and greater competitiveness to come”. Mr Gurría also

described the OECD’s contribution to this success story, which began before membership, in the Partners in Transition programme, he recalled. Over the years, the organisation has helped develop Poland’s modern tax system, competition law and pension reform, while the combat against inflation also reflected OECD policy advice. Labour market reform and public governance have also benefited.

The secretary-general saw some difficult challenges ahead, with stubborn unemployment, high public spending and taxation, and emigration. Fighting corruption was another challenge, and the OECD chief emphasised the need to make Poland “a more attractive place for the creation of businesses and employment”.

Reforms are not easy to implement, and the OECD’s mandate was to “make reforms happen without losing the support of voters”, Mr Gurría remarked. The secretary-general concluded by reaffirming the OECD’s readiness to back Poland “in all those areas where progress is lagging”. ■

The full speech, “A vision for Poland: Joining the world’s most advanced countries”, is available online at www.oecd.org/speeches

Other recent speeches by Secretary-General Angel Gurría

For a complete list, including those in French and Spanish, go to www.oecd.org/speeches

Principles for fighting corruption: from criminalisation to self-regulation?

7 December 2006
Address given at a French enterprise movement (MEDEF) colloquium.

OECD work on international migration

4 December 2006
Speech delivered to a meeting of the Network of SOPEMI Correspondents (Continuous Reporting System on International Migration) in Paris.

The role of the OECD in the economic transition of central and eastern European countries

24 November 2006
Speech delivered at the Centre for Eastern Studies, during an official visit to Poland.

Challenges of globalisation:

The role of the OECD
24 November 2006
Lecture delivered at the Economics University of Warsaw.

Restated OECD Jobs Strategy: diagnostic, limits and evidence for France

16 November 2006
Speech delivered during the colloquium organised by the OECD and the French institution

DARES (Direction de l’Animation de la Recherche, des Études et des Statistiques).

Building an innovative city: The macro perspective

5 November 2006
Remarks delivered at the 18th annual meeting of the International Business Leaders Advisory Council, in Shanghai, China.

On globalisation and its benefits

25 October 2006
Speech to the Foreign Affairs Commission of the National Assembly, France, in the presence of the prime minister, Dominique de Villepin.

Global challenges for the XXIst century—climate change, energy and democratic institutions

21 October 2006
Speech given at the annual

conference of the Club de Madrid.

What policies for globalising cities? Rethinking the urban policy agenda

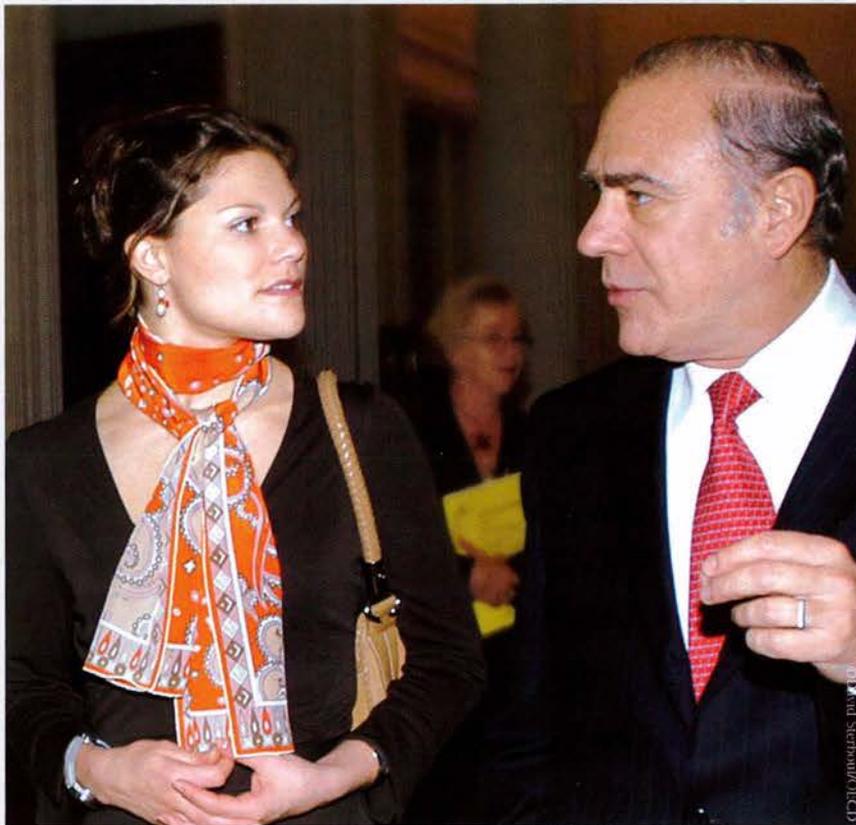
20 October 2006
News statement announcing the OECD international conference on cities, to be held in Madrid on 29-30 March 2007.

Recent developments in OECD economies and implications for Turkey

17 October 2006
Address to the Turkish Industrialists’ and Businessmen’s Association (TUSIAD).

Corporate governance in Turkey

17 October 2006
Speech delivered at the presentation of the OECD’s report on *Corporate Governance in Turkey: A Pilot Study*.



Royal visit

Her Royal Highness Crown Princess Victoria of Sweden visited the OECD headquarters in Paris on 4 December 2006. The Crown Princess met OECD Secretary-General Angel Gurría, other senior officials of the OECD Secretariat and Swedish personnel in the OECD. Crown Princess Victoria was participating in a diplomat training programme at the Swedish Ministry of Foreign Affairs. Discussions at the OECD covered the economy, agriculture, trade and early childhood education and care. ■

Ask the Economists!

“There was a lot of talk when Yukos was dragged through the courts that Western firms would be more wary of investing in Russia. Has there been any real impact on the investment climate since then or are the potential profits too tempting to deter foreign investors?” This was one of the pointed questions posted to the OECD in a live online debate at OECD.org, Ask the Economists! In a session called “Russia—Will the boom bust?” on 11 December, William Tompson, lead author of the recent OECD economic survey of Russia, was in the hot seat to field questions from online visitors on everything from business investment and perestroika to energy and health care reform.

It was the second in a brand new series of OECD online debates, which are open to everyone. The aim is to give people the opportunity to question an OECD expert on a topical issue during a two-hour session. The previous inaugural session, entitled “Grappling with the world’s new IT giants”, answered questions on the rise of China and India in the high-tech industry in what proved to be a lively discussion.

To read or join in the debates, see www.oecd.org/economics/ask. Check the websites at www.oecd.org and www.oecdobserver.org regularly for new topics or sign up to our e-alert service. ■

Building works

White protective covers drape the main OECD office building as asbestos is removed. The OECD headquarters renewal project also includes renovation of the château (built in 1922) and construction of an entirely new conference centre. The château renovation was completed in 2005, while the new OECD conference centre is

expected to be open for business in the second half of 2007. The white covers are now coming off the office building, which is expected to re-open fully in early 2009 following major restructuring works. A French-American team of architects SCAU Macary, Menu & Delamain, and Pei, Cobb, Freed & Partners is leading the project which began in 2003. For more information, see OECD Headquarters Site Redevelopment Project at www.oecd.org or contact observer@oecd.org. ■



Calendar of forthcoming events

Please note that many of the OECD meetings mentioned are not open to the public or the media and are listed as a guide only. All meetings are in Paris unless otherwise stated. For a more comprehensive list, see the OECD website at www.oecd.org/media/upcoming, which is updated weekly.

DECEMBER - Highlights

- 4-6 High-level meetings of the **Global Forum on Development**, organised by the Development Co-operation Directorate, the Development Centre, the World Bank and the World Health Organization.
- 7-8 **Intellectual Asset-Based Management: Toward Innovation and Sustainable Growth**, conference organised by the Directorate for Science, Technology and Industry and the Japanese government. Tokyo, Japan.
- 11 **Measuring the Impacts of Biotechnology**, workshop organised by the Directorate for Science, Technology and Industry.
- 12-13 **NEPAD-OECD Investment Initiative: Mobilising Private Investment in Africa in Support of Development—Laying the Foundations for Sustained Progress**, organised by the Directorate for Financial and Enterprise Affairs. Brazzaville, Congo.

JANUARY 2007

- 8-9 **Illegal Logging**, conference organised by the OECD Roundtable on Sustainable Development.

- 24-28 **World Economic Forum annual meeting**. Davos, Switzerland.

FEBRUARY

- 5-6 **Public-Private Partnerships**, symposium organised by the Directorate for Public Governance and Territorial Development.
- 7-8 **Public Policies for the Development of Mexico**, forum organised by the OECD, the World Bank, the UN and the Inter-American Development Bank. Mexico City, Mexico.
- 8-9 **Statistics, Knowledge and Policy**, conference as part of OECD's project on "Measuring the Progress of Societies", organised by the Statistics Directorate. Seoul, Korea.

MARCH

- 8-9 **Developing Sustainability Strategies in Asia**, conference organised by the OECD and the UN. Bangkok, Thailand.
- 22 **Foundations as Partners in Development Finance**, conference as part of the OECD Global Forum on Development. Lisbon, Portugal.

- 29-30 **What Policies for Globalising Cities? Rethinking the Urban Policy Agenda**, conference organised by the Directorate for Public Governance and Territorial Development and the Club of Madrid. Madrid, Spain.

APRIL

- 3-4 **Policy Reform Options for Effective Development Finance**, high-level plenary meeting of the Global Forum on Development.
- 4 High-level meeting of the **Development Assistance Committee (DAC)**.
- 14-15 Spring meetings of the **IMF and the World Bank**.

MAY

- 14-15 **OECD Forum 2007: Innovation for Growth and Equity: OECD Agenda for Globalisation**.
- 14-15 The **International Energy Agency (IEA) meets at ministerial level**.
- 15-16 The **OECD Council meets at ministerial level**, chaired by Spain.

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HIGHLIGHTS

FORUM 2007

The "MUST GO" event on today's international calendar!

Economy and finance

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GLOBALISATION

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OECD Forum 2007, 14-15 May, Paris
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Fuelling emissions

Decoupling the Environmental Impacts of Transport from Economic Growth



Transport is the main cause of carbon dioxide emissions, ahead of power generation or industry. While aviation accounts for 14% of transport-based CO₂ emissions in the EU, roads have a larger effect. In OECD countries, road transport accounts for over 80% of all transport-related energy consumption, for most of the accidents and the majority of air pollutant emissions, noise and habitat degradation.

But does the negative impact of transport on the environment have to be in step with economic growth? No, says the OECD in a recent report, *Decoupling the Environmental Impacts of Transport from Economic Growth*. For instance, since 1980, the US experienced a relative “decoupling” of transport from GDP growth: between 1970 and 2000, GDP increased by 160% whereas passenger transport rose more slowly, by 120%. Can such decoupling be improved further? Yes, says the OECD report, if we “get the prices right”. Some level of decoupling is already happening in the transport sector of many OECD countries for certain emissions, such as sulphur dioxide and nitrous oxide, but not for CO₂ particularly where road transport or aviation is concerned.

Still, governments are trying. Consider China, which is on a fast track to becoming both one of the car capitals and pollution capitals of the world. In an attempt to decouple economic growth from environmental damage, central planners have mandated some of the world’s toughest fuel-efficiency standards. China has also become one of the largest markets for alternative-fuel vehicles. In preparation for the 2008 Olympic Games, Beijing officials plan to convert their entire bus fleet of nearly 120,000 vehicles to run on compressed natural gas.

Shifting to environmentally-friendly modes of transport is good practice, though *Decoupling the Environmental Impacts of Transport from Economic Growth* would also urge such efficient use of charges, fees, taxes and other economic instruments as well as regulatory measures. Road pricing, for instance, has been shown to encourage shifts in transport modes, journey destinations and even business and home location. The report states that highway tolls tend to be more price-sensitive if there is a parallel free roadway, while driving is less price-sensitive in automobile-dependent areas where transport alternatives are difficult to use. Furthermore, studies suggest that fuel price changes have a significant negative effect on car fuel demand, since a 10% increase in fuel price results in a 7% reduction in demand. On the flipside, an increase of 10% in income will lead to a 10% increase in car ownership, and a 12% increase in both car fuel demand and travel demand. ■

ISBN 9264027130

Sustainable mobility

Speed Management



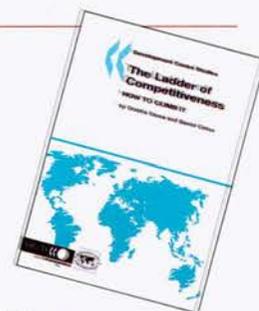
Speeding is responsible for a third of road fatalities in most OECD countries. *Speed Management* states that reducing average speeds on the roads by only 5% can save around 20% of current fatalities. What is more, it can help with environment management, reduce energy consumption and improve the quality of life for nearby residents.

The book compares and assesses such speed-control tools as the use of traffic signs and pedestrian-crossing islands, speed camera programmes, and message signs that display both the limit and the speed of approaching vehicles. With the development of automobile technology, such as GPS tracking, for example, monitoring systems are being developed that allow continuous tracking of speed and driver behaviour. ■

ISBN 9282103781

Another rung

The Ladder of Competitiveness: How to Climb it



League tables of competitiveness give an easily comparable ranking of the global economic performance, but they leave underlying questions unanswered. Why are the “poor” countries four times less productive than the “rich” ones, for instance? And what do these rankings say about the role of human capital, or financial markets or physical infrastructure?

In an effort to correct for this, a new study by the OECD Development Centre, *The Ladder of Competitiveness: How to Climb it*, presents three rankings to emphasise different factors. The standard ranking covers 51 countries and is based on total productivity: Japan comes in first, while Bangladesh is last. One alternative ranking is aimed at firms wanting to invest in a country. On this scale, the US comes first and India last. The third ranking is destined for investors interested in trade: Sweden ranks first and Central African Republic last.

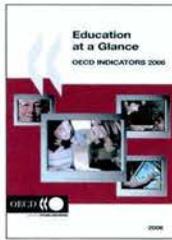
Of the 51 countries ranked, balanced countries like the US, Norway and Sweden still come out on top, yet the authors conclude that in terms of competition, that does not mean a country is not vulnerable. Japan, for instance, comes in first in productivity and ranks second on the “investor” scale, but drops to 24th in “exporter” ranking. ■

ISBN 9264028277

See the order form or www.oecdbookshop for ordering details.

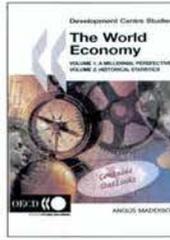
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HIGHLIGHTS



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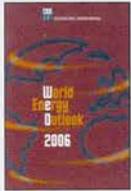
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HIGHLIGHTS



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Tight genes

Creation and Governance of Human Genetic Research Databases



The Icelandic Health Sector Database was started in 1998 to develop improved methods of achieving better health, and prediction, diagnosis and treatment of disease. Worthwhile goals, yet it was stalled by controversy over the issue of consent. The CARTaGENE project, a proposed 50-year genetic profile of the Quebec population, got started in 1999, and is still awaiting ethics and privacy approval from the government.

The ever-expanding content of genetic and biological data, the increasing facility to share them, and the importance of genetics in understanding human health have created a brave new world of issues and concerns. Who owns the data, information and biological samples contained in a genetic database project? What criteria should be used to determine whether a bio-bank should be a public or private undertaking? Should participants be remunerated? What constitutes informed consent? Should children be included in genetic studies, and if so, what safeguards should be considered?

This report, *Creation and Governance of Human Genetic Research Databases*, kick-starts the process of considering international policy

challenges associated with the establishment, management and governance of human genetic research databases.

One of the most consistent themes that emerges is the importance of gaining and respecting the public's trust. Losing this, as seen with the controversy over genetically modified organisms, can have a profound impact on research and the acceptance of new technologies. Furthermore, commercial use raises tensions between free access to data and the desire for commercial benefits.

Certainly not all efforts at developing genetic banks are being held back. The GenomEUtwin project, supported by the European Commission, is focusing on twin and other population cohorts to pull out the genetic, environmental and lifestyle components indicated in health problems such as obesity, migraine, stature, heart disease, stroke and longevity. It has collected data from all across Europe, including Danish, Dutch, Finnish and Italian twins, among many other sources. Tens of thousands of DNA samples have been collected and stored since 2002, and the information is accessible to investigators worldwide.

Large-scale studies of populations like this may contribute to science's understanding of the complex diseases and improvements in prevention and cure, but as *Creation and Governance of Human Genetic Research Databases* shows, the policy implications have to be dealt with seriously. ■

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Jean-Philippe Cotis

Economic outlook

Smooth rebalancing?

Jean-Philippe Cotis, OECD Chief Economist

Until recently, the OECD area was enjoying a prolonged period of non-inflationary growth despite rising oil and commodity prices. Underlying these favourable trends, persistent wage moderation provided for both price stability and strongly rising profits as well as vigorous job creation in the main OECD regions.

This smooth performance has been somewhat disturbed recently, however. In the US, signs of inflationary pressures and labour market tensions have recently built up while investment in housing has fallen sharply, following a long boom in residential construction. In the OECD area as a whole, however, there are still few signs of general overheating. Aggregate demand and supply broadly match, in contrast with the previous cyclical peak at the turn of the century when demand pressures were much stronger. While in the US and Japan aggregate demand may be somewhat above trend, in the euro area substantial slack remains.

Rather than a major slowdown, what the world economy may be facing is a rebalancing of growth across OECD regions. Indeed, recent developments point to an unwinding of cyclical differences, with

activity having slowed in the US and Japan, and gathered speed in Europe. Looking ahead, and given what is seemingly a mild degree of initial excess demand in the US and Japan, the slowdown in these countries should remain well-contained. In the euro area, recent hard data as well as business and

Rather than a major slowdown, what the world economy may be facing is a rebalancing of growth across OECD regions.

consumer confidence suggest that a solid upswing may be underway. In addition, growth should remain buoyant in China, India, Russia and other emerging economies. All in all, Japan and the euro area would grow slightly above trend over the next two years while US growth would return progressively to potential in the course of 2007, following the recent steep deceleration in activity.

In its initial phase, however, this growth rebalancing would not be strong enough to prevent a mild and short-lived weakening in 2007 in the OECD area. As a matter of fact,

a variety of factors, including needed fiscal consolidation in Germany and Italy, would weigh down on euro-area activity next year before it accelerates anew.

The projected “soft landing” in the US implies that history would not repeat itself. In 2000, aggregate demand vastly exceeded potential supply, calling for a strong downward adjustment in activity. Today, the degree of overheating still looks modest despite some tensions in US labour markets, which should recede progressively. In fact, the increase in core inflation witnessed through to last summer owed a lot to past hikes in oil and gasoline prices, which have now partly been reversed. Because of its high energy intensity, the American economy has been subjected to a stronger external inflationary shock than the OECD average, and this has shown up in both headline and core inflation. Assuming a stabilisation in oil prices around their current levels, a mild economic slowdown may be enough to progressively restore price stability in the US.

In Japan, the return to price stability is proving longer and less assured than expected. Looking at GDP deflators and at consumer price inflation excluding food and energy, deflation is not over yet. Somewhat worryingly, nominal wage growth may be at risk of tapering off after only 18 months in mildly positive territory. Although strong profits and export markets will continue to underpin Japanese growth, it also relies on at least moderate support from household spending.

In the euro area, activity has finally taken off, following a series of false starts. The recent fall in oil prices has driven headline inflation back below the 2% threshold and is welcome for growth as well. Notwithstanding the upcoming VAT hike in Germany, which should impart a mild stagflationary shock to the euro area in early 2007, the central scenario for the next two years is one of stable growth, somewhat above potential, and mild inflation, in a context where the shortfall of aggregate demand is being progressively worked off.

But sustainable growth in the OECD does not only hinge on the balance between aggregate demand and supply. It can also be

affected by current account imbalances or, in other words, by imbalances in the distribution of aggregate demand between its domestic and external components.

Clearly, achieving price and output stability requires macroeconomic policies to first balance aggregate supply and demand. But policies to this end find their limits when they generate unsustainable current account imbalances. To balance aggregate demand and supply earlier during this decade, US policy had to offset weakening external demand, resulting in part from anaemic domestic demand in Europe and Japan, by stronger demand at home. Besides an expansionary fiscal stance, accommodating monetary policy boosted domestic demand, not least through higher asset prices and wealth effects, one particularly strong channel of transmission running through housing markets. This housing channel contributed strongly to output stabilisation in the aftermath of the 2001 recession but also to the deterioration of the US current account deficit. Conversely, it now plays an important rebalancing role, both domestically and externally. A cooling housing market should therefore not necessarily be a cause for anxiety.

Although in recent years housing markets have played an important role in supporting economic activity, prices may now have reached unsustainable highs in certain countries (notably the US, Denmark, France and Spain), at least according to OECD estimates. When price corrections set in, housing markets may thus reduce the speed of economic expansion, even though the economy at large is not strongly overheating and macroeconomic policies are only mildly restrictive.

Within certain bounds, such corrections should not be a cause of concern. However, history suggests that sharp housing corrections can be hard to contain. It is especially so when, as a starting point, the economy is out of kilter, with both over-extended financial markets and clearly overheated product markets. Today, however, this is not the case, implying that a smoother adjustment may be in the offing for the US economy. Recent Australian and UK experience—admittedly helped by favourable

OUTLOOK SUMMARY*

2006 2007 2008

Real GDP growth (% change)

United States	3.3	2.4	2.7
Japan	2.8	2.0	2.0
Euro area	2.6	2.2	2.3
Total OECD	3.2	2.5	2.7

Inflation (%)

United States	2.9	2.6	2.6
Japan	-1.0	0.2	0.6
Euro area	1.8	2.0	2.0
Total OECD	2.2	2.2	2.1

Unemployment (%)

United States	4.6	4.8	5.1
Japan	4.2	3.9	3.6
Euro area	7.9	7.4	7.1
Total OECD	6.0	5.8	5.7

Current account balance (% of GDP)

United States	-6.6	-6.5	-6.6
Japan	3.8	4.5	5.3
Euro area	-0.3	-0.1	-0.1
Total OECD	-2.0	-1.9	-1.8

Short-term interest rate (%)

United States	5.2	5.3	5.0
Japan	0.2	0.4	0.9
Euro area	3.1	3.8	4.0

World trade growth (% change) 9.6 7.7 8.4

* Assumptions underlying the projections include: no change in actual and announced fiscal policies; unchanged exchange rates as from 13 November 2006; in particular 1\$ = 118.10 yen and 0.78 euros; the cut-off date for other information used in the compilation of the projections is 20 November 2006.

Source: *OECD Economic Outlook* Preliminary Edition, No. 80, November 2006

circumstances—indeed suggests that for resilient economies landings can be smooth.

In this respect, it is comforting to note that in many countries, households seem well prepared to cope with the consequences of a downturn in housing markets, as documented in the special chapter in the latest *OECD Economic Outlook*. Household balance sheets are generally sound and debt-servicing burdens still moderate, although some low-income households may be overstretched.

With housing headwinds already affecting the US economy and at risk of materialising

elsewhere, it would help the world economy if domestic and household spending fully revived where they have been lagging behind. This challenge may be progressively met in economies such as Germany and Japan, but the outlook for household spending remains somewhat fragile and these countries' current account surpluses would continue to build up, exceeding 5% of GDP by 2008. The projection also implies that the widening of the Chinese surplus would slow. As a counterpart to these trends, and a novel feature of this *Outlook*, the US current account imbalances would stop worsening, albeit partly owing to the recent fall in energy prices.

Against this backdrop, central banks face different challenges. In the US, bringing inflation back to around the 2% mark may require maintaining the current restrictive stance for some time. In the euro area, where the recovery is expected to last, moving towards a measure of monetary restraint may be justified as insurance against the risk of inflation pressure down the line. In Japan, further monetary tightening should wait until a fully-fledged exit from deflation finally materialises.

On the fiscal and structural reform front, not enough is being done in large OECD countries. Although governments today seem much less inclined to spend away tax windfalls than in the past, they generally are not taking advantage of the good overall economic outlook to reduce underlying deficits, with the notable exception of Germany. Besides, social security, health system and labour market reforms do not seem to feature high on political agendas, and protectionist pressures seem to be mounting.

Ideally, OECD countries would seek growth-oriented policy mixes, where solid fiscal consolidation and structural reforms elicit in turn more accommodating monetary conditions and stronger investment. Regrettably, however, best practice seems some way off. ■

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United States

Long-term challenges

Output growth has slowed from the rapid rates of recent years. House-building has declined especially sharply. But with this and other adjustments being localised and temporary, healthy growth in GDP should soon resume. Core inflation has risen, partly reflecting the flow-on of higher energy prices to other goods and services. But assuming energy prices level out, this effect will fade and inflationary pressures should subside.

With core inflation uncomfortably high, monetary policy is now mildly restrictive. There may be scope for reductions in interest rates once core inflation is on a clear downward trajectory. The federal government budget deficit has fallen but it may stay around 2% of GDP over the forecast horizon. In addition, long-term challenges of funding entitlements are becoming steadily more pressing and remain to be addressed.

KEY ECONOMIC FORECAST & INDICATORS

Population (000s) 2005	296 410
Area (000 sq km)	9 376
Currency	Dollar
GDP (Billion USD) - 2005	12 428.5
Life expectancy at birth (Women, Men) - 2003	80.1, 74.8
Total labour force (000s) 2005	150 564
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.3	2.4	2.7
Household savings ratio	-0.2	0.9	1.7
Consumer price index	3.3	2.3	2.3
Short-term interest rate (%)	5.2	5.3	5.0
Unemployment rate (%)	4.6	4.8	5.1
General government financial balance (% GDP)	-2.3	-2.8	-3.0
Current account balance (% GDP)	-6.6	-6.5	-6.6

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Japan



Historic recovery continues

The current economic recovery, the longest in Japan's post-war history, has matured into a self-sustained expansion driven by private domestic demand. The expansion is projected to continue, with growth of about 2% in 2007-08, thanks to buoyant business investment underpinned by record corporate profits and private consumption. Inflation is expected to increase only gradually.

The Bank of Japan should not raise the short-term policy interest rate further until inflation is firmly positive and the risk of renewed deflation becomes negligible. Raising the lower limit of the 0 to 2% understanding of price stability would be appropriate. The government should establish a more detailed medium-term fiscal plan, while strengthening the link between the plan and the annual budget process. Further structural reform, including regulatory reform in a broad range of areas, is needed to sustain growth in the face of rapid population ageing.

Population (000s) 2005	127 757
Area (000 sq km)	378
Currency	Yen
GDP (Billion USD) - 2005	3 901.6
Life expectancy at birth (Women, Men) - 2004	85.6, 78.6
Total labour force (000s) 2005	66 500
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.8	2.0	2.0
Household savings ratio	2.9	2.9	2.9
Consumer price index	0.3	0.3	0.8
Short-term interest rate (%)	0.2	0.4	0.9
Unemployment rate (%)	4.2	3.9	3.6
General government financial balance (% GDP)	-4.6	-4.0	-3.7
Current account balance (% GDP)	3.8	4.5	5.3

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	82 466
Area (000 sq km)	357
Currency	Euro
GDP (Billion USD) - 2005	2 461
Life expectancy at birth (Women, Men) - 2004	81.4, 75.7
Total labour force (000s) 2005	41 040
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.6	1.8	2.1
Household savings ratio	10.5	10.3	10.1
Consumer price index	1.7	1.9	1.0
Short-term interest rate (%)	3.1	3.8	4.0
Unemployment rate (%)	8.0	7.7	7.2
General government financial balance (% GDP)	-2.3	-1.4	-1.3
Current account balance (% GDP)	4.0	4.8	5.2

Source: OECD

Germany



A sustainable recovery

The economy has entered a sustainable recovery and is projected to grow above potential throughout the projection period, although growth is expected to fall temporarily below 2% in 2007 in the wake of the value-added tax rate increase. The growth impetus is likely to shift from exports and investment to consumption in 2008, as unemployment recedes and real incomes rise. The government deficit is projected to fall to 2.25% of GDP this year and below 1.5% in 2007 and 2008.

Further expenditure-based fiscal consolidation would improve sustainability and create more room for the operation of automatic fiscal stabilisers. Placement of the long-term unemployed into jobs needs to improve further, including through more effective assignment of placement responsibilities across levels of government. Strengthening competition in product markets—such as in liberal professions and network industries—would make the economy more resilient and raise growth prospects beyond the cyclical recovery.



France

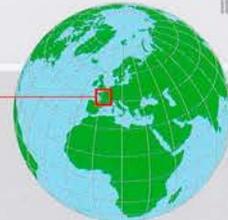
Firmer activity

Economic activity picked up in the second quarter but stalled in the third. It is likely to recover and continue growing slightly faster than potential over the forecast period; the output gap should gradually shrink. Sustained by firmer activity, employment growth should gain strength and the fall in unemployment should continue, albeit at a slower pace than in 2006. Wage growth is likely to accelerate slightly and inflation to increase, while remaining moderate.

The government deficit is expected to diminish in 2006 as a result of slower public spending increases and substantial increases in tax revenues. The long-term challenge is to reduce the structural deficit and hence restore the sustainability of public finances in order to cope with the pressures of an ageing population. If any far-reaching improvement in the labour market situation is to be achieved, the cost burden on firms must be reduced and made more predictable and wage moderation must continue.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	60 873
Area (000 sq km)	549
Currency	Euro
GDP (Billion USD) - 2005	1 896.4
Life expectancy at birth (Women, Men) - 2004	83.8, 76.7
Total labour force (000s) 2005	27 475
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.1	2.2	2.3
Household savings ratio	11.5	11.5	11.2
Consumer price index	2.0	1.4	1.6
Short-term interest rate (%)	3.1	3.8	4.0
Unemployment rate (%)	9.1	8.5	8.2
General government financial balance (% GDP)	-2.7	-2.5	-2.3
Current account balance (% GDP)	-1.7	-1.8	-1.8

Source: OECD



United Kingdom

Improve skills

GDP growth is expected to continue at its recent pace of 2.5 to 2.75%, supported by buoyant domestic demand. Exceptionally strong labour force growth—driven by high immigration and rising participation—is outstripping employment growth, pushing the unemployment rate up. The resulting labour market slack should help to ensure that the anticipated fourth quarter spike in headline inflation does not push up inflationary pressures, and that headline inflation moves back to the 2% target in 2007.

Spending restraint and achieving value for money in public spending will be the challenge for fiscal policy over the next few years and will be crucial if a decisive reduction of the government deficit is to be achieved. Following recent monetary policy tightening, the case for further increases in interest rates is not compelling. To raise potential growth, policy should focus on improving workforce skills and continuing the national roll-out of the reformed disability scheme.



Population (000s) 2005	59 989
Area (000 sq km)	245
Currency	Pound
GDP (Billion USD) - 2005	1 928.7
Life expectancy at birth (Women, Men) - 2003	80.7, 76.2
Total labour force (000s) 2005	29 517
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.6	2.6	2.8
Household savings ratio	5.3	5.6	5.7
Consumer price index	2.2	2.0	1.9
Short-term interest rate (%)	4.8	5.0	4.8
Unemployment rate (%)	5.5	5.7	5.8
General government financial balance (% GDP)	-3.0	-2.7	-2.6
Current account balance (% GDP)	-2.4	-2.0	-2.1

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Italy



Policy tightening

A recovery in 2006 signals an end to four and a half years of near stagnation. The main driving forces have been strong export market growth, easy credit conditions, reform-led employment growth and improving confidence. Growth is likely to slow in 2007 partly due to policy tightening, but rebound by 2008.

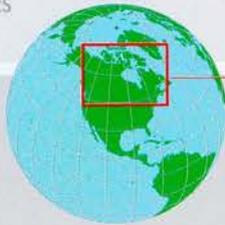
The 2007 fiscal consolidation rests for the most part on projected revenue hikes, which might increase work and investment disincentives. Containment of spending pressure is therefore needed, notably in the pension, public employment, local authorities and health areas as indicated in the government's own medium term plan. To keep inflation under control, it will be important to fully implement announced product market reforms. More decentralised wage setting could further help to recoup past competitiveness losses.

Population (000s) 2005	58 135
Area (000 sq km)	301
Currency	Euro
GDP (Billion USD) - 2005	1 666.4
Life expectancy at birth (Women, Men) - 2003	82.5, 76.8
Total labour force (000s) 2004	24 451
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	1.8	1.4	1.6
Household savings ratio	10.2	9.5	10.0
Consumer price index	2.2	1.9	2.0
Short-term interest rate (%)	3.1	3.8	4.0
Unemployment rate (%)	7.1	6.8	6.5
General government financial balance (% GDP)	-4.8	-3.2	-3.3
Current account balance (% GDP)	-2.2	-2.2	-2.6

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	32 271
Area (000 sq km)	9 976
Currency	Dollar
GDP (Billion USD) - 2005	1 081.8
Life expectancy at birth (Women, Men) - 2003	82.4, 77.4
Total labour force (000s) 2005	17 402
Government type	Confederation

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.8	2.7	3.1
Household savings ratio	1.5	1.1	1.3
Consumer price index	2.1	1.5	2.0
Short-term interest rate (%)	4.2	4.3	4.3
Unemployment rate (%)	6.4	6.6	6.5
General government financial balance (% GDP)	0.9	0.8	0.8
Current account balance (% GDP)	1.1	0.1	0.0

Source: OECD

Canada



Fiscal prudence

Following tighter monetary conditions, terms-of-trade losses and weaker exports, activity has recently eased and the economy is estimated to be operating close to its potential level. Looking forward, it is expected to benefit from a pick-up in some external markets while domestic demand decelerates modestly following its recent robust expansion. Inflation pressures are likely to remain limited, as energy prices have fallen from recent peaks and wages may rise only moderately.

In the context of on-target inflation and a modest pick-up in activity, the Bank of Canada should keep its policy rate constant so long as no nation-wide labour market pressures come into view. At the same time, fiscal settings at all levels of government need to remain prudent and the federal government should focus on reducing the debt burden before ageing pressures accumulate.



Euro area

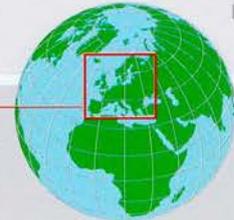
A surer footing

After several false starts, the economic recovery has taken hold. Activity in the first half of 2006 grew at the fastest pace for some years. Exports and investment have been the main drivers, but there are signs that households have started to boost spending as well. Consumption should underpin the recovery, with business and residential investment playing less of a role than they have done recently. Overall, GDP is projected to grow in the 2 to 2.5% range through 2007 and 2008.

With the recovery on a surer footing, monetary stimulus should be removed. If the recovery maintains strong momentum, there may be a need to raise interest rates further in 2008 as well. The improvement in the fiscal position is welcome, especially in the countries that had high deficits, but further steps are needed to move towards a sustainable fiscal position. Additional reforms to enhance the single market would improve the euro area's economic performance and its resilience to shocks.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	311 357
Area (000 sq km)	2 503
Currency	euro
GDP (Billion USD) - 2005	9602.2
Life expectancy at birth (Women, Men) - 2004	81.9, 76.0
Total labour force (000s) 2005	146 265

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.6	2.2	2.3
Household savings ratio	10.1	10.0	9.9
Consumer price index	1.4	1.9	1.8
Short-term interest rate (%)*	3.1	3.8	4.0
Unemployment rate (%)	7.9	7.4	7.1
General government financial balance (% GDP)	-2.1	-1.5	-1.4
Current account balance (% GDP)	-0.3	-0.1	-0.1

Source: OECD



Australia

Drought challenge

A pick-up in export volumes is likely to bring output growth gradually back up above the trend rate of over 3% by 2008, despite a decline in the terms of trade and a cooling of the business investment boom. However, growth will be held back in 2007 by the effect of a drought on the agricultural sector.

Interest rates are close to a level that should ensure inflation returns to the target over the coming year. A modest fiscal surplus should be maintained, as buoyant tax receipts related to the commodities boom will be transitory. Skill shortages have threatened to reduce growth and prompted the recent announcement of a new skills initiative. Constraints on trading water need to be removed so that scarce water moves to higher value uses.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	20 329
Area (000 sq km)	7 687
Currency	Dollar
GDP (Billion USD) - 2005	672.9
Life expectancy at birth (Women, Men) - 2004	83.0, 78.1
Total labour force (000s) 2005	10 575
Government type	Independent Federal State, UK Monarch

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.6	3.0	3.4
Household savings ratio	-1.7	-0.8	-1.2
Consumer price index	3.7	2.8	2.5
Unemployment rate (%)	5.0	5.0	5.1
General government financial balance (% GDP)	2.5	1.9	1.4
Current account balance (% GDP)	-5.5	-5.6	-5.2

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Austria



Inflation contained

Driven by strong investment and exports, GDP growth is expected to pick up to above 3% in 2006 before slowing to 2.5% in 2007. With the economy still operating somewhat below potential, inflationary pressures are likely to be contained, particularly in light of continued wage restraint.

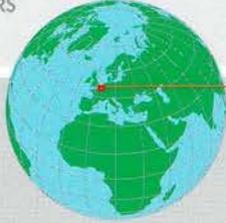
The fiscal deficit is likely to be below 1.5% of GDP in 2006. However, the projected impact of the recent tax cuts imply that avoiding a future deterioration of the general government balance will require additional efforts at fiscal consolidation, notably through expenditure cuts.

Population (000s) 2005	8 233
Area (000 sq km)	84
Currency	Euro
GDP (Billion USD) - 2005	276.4
Life expectancy at birth (Women, Men) - 2004	82.1, 76.4
Total labour force (000s) 2005	4 032
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.2	2.5	2.4
Household savings ratio	9.7	9.7	9.6
Consumer price index	1.7	1.8	2.0
Unemployment rate (%)	5.5	5.5	5.5
General government financial balance (% GDP)	-1.3	-1.6	-1.5
Current account balance (% GDP)	2.3	2.6	3.6

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	10 438
Area (000 sq km)	31
Currency	Euro
GDP (Billion USD) - 2005	340.9
Life expectancy at birth (Women, Men) - 2003	81.7, 75.9
Total labour force (000s) 2005	4 669
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.9	2.3	2.1
Household savings ratio	11.5	11.5	11.3
Consumer price index	2.4	1.7	1.8
Unemployment rate (%)	8.6	8.3	8.0
General government financial balance (% GDP)	0.0	-0.2	-0.2
Current account balance (% GDP)	2.0	1.9	1.6

Source: OECD

Belgium



Momentum slows

After healthy growth in 2006, economic momentum is expected to slow somewhat during the next two years. Domestic demand is being sustained by higher real incomes and employment increases, but continued export market losses show that the economy is not fully benefiting from the international recovery. Despite the slowdown, economic growth will remain higher than the potential rate of just below 2%, closing the output gap by end-2008. There are already signs that slack is disappearing in some parts of the economy. Nevertheless, core inflation is projected to remain subdued while headline inflation falls forwards towards the core rate on the back of lower oil prices.

The fiscal objectives are to generate increasing budget surpluses over the projection period as part of the strategy to pre-fund future ageing-related cost. Reaching the 2007 objective, however, relies on the use of one-off fiscal measures and higher indirect taxes. A sustainable path for public finances could be secured by fiscal consolidation through a combination of expenditure restraint and labour market measures to stimulate job creation and increase employment rates, particularly for younger and older workers who both have relatively low labour market participation rates.



Czech Republic

Inflation to rise

Growth peaked at the end of 2005 and is expected to level out over the projection period with annual GDP growth averaging 5.25% over 2006-08. While export and investment growth are expected to remain strong and household consumption growth to increase, these will be accompanied by stronger import growth. Headline inflation will be pushed up, largely due to increases in excise duty and price deregulation.

Political stalemate following the general election in June has meant delay in the structural reforms needed for sustainable deficit reduction. No concrete progress is being made in either pensions or healthcare and weaknesses in the Medium-term Expenditure Framework are not being addressed.



KEY ECONOMIC FORECAST & INDICATORS

Population (000s) 2005	10 221
Area (000 sq km)	79
Currency	Koruna
GDP (Billion USD) - 2005	206.5
Life expectancy at birth (Women, Men) - 2004	79.0, 72.6
Total labour force (000s) 2005	5 174
Government type	Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	6.2	4.8	4.6
Consumer price index	2.8	3.4	3.1
Unemployment rate (%)	7.3	6.8	6.3
General government financial balance (% GDP)	-3.7	-4.1	-4.3
Current account balance (% GDP)	-2.9	-2.0	-2.0

Source: OECD



Denmark

Labour shortages

GDP has expanded strongly during 2006 and is now well above potential. With a continuing housing boom and strong external demand, labour shortages have become very clear. Domestic firms are losing market share, and wages have started to accelerate, in particular in the construction sector.

Although short-term interest rates are rising, monetary conditions are still too stimulative, making more critical the need to avoid fiscal slippages in 2007. Efforts to expand labour supply should continue, and measures to cool down aggregate demand should be ready in case wages and prices start overheating.



Population (000s) 2005	5 416
Area (000 sq km)	43
Currency	Krone
GDP (Billion USD) - 2005	186.3
Life expectancy at birth (Women, Men) - 2004	79.9, 75.2
Total labour force (000s) 2005	2 876
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.5	2.6	1.6
Household savings ratio	-2.2	-1.1	-0.9
Consumer price index	2.0	2.1	2.6
Unemployment rate (%)	3.8	3.3	3.3
General government financial balance (% GDP)	3.4	3.2	3.2
Current account balance (% GDP)	1.3	1.8	1.3

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Finland



Robust

Economic activity grew rapidly in the first half of 2006. Strong growth this year is partly explained by the rebound from last year's labour dispute in the forestry industry. But underlying growth is also robust, with output expected to expand at close to its trend rate of 3% over the next two years. Unemployment is projected to fall to around 7% by the end of the projection period, which would be the lowest rate since the early 1990s.

To facilitate job creation and alleviate bottlenecks in labour supply due to the ageing of the population, remaining pathways to early retirement should be phased out and greater wage flexibility in the central wage agreements put in place. To avoid a pronounced house price cycle, incentives for municipalities to provide land for house building in fast-growing regions need to be sharpened.

Population (000s) 2005	5 246
Area (000 sq km)	338
Currency	Euro
GDP (Billion USD) - 2005	164.6
Life expectancy at birth (Women, Men) - 2004	82.3, 75.3
Total labour force (000s) 2005	2 641
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	5.0	2.8	2.7
Consumer price index	1.3	1.4	1.5
Unemployment rate (%)	7.8	7.6	7.4
General government financial balance (% GDP)	2.5	2.4	2.2
Current account balance (% GDP)	6.8	7.4	7.7

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	11 099
Area (000 sq km)	132
Currency	Euro
GDP (Billion USD) - 2005	257.2
Life expectancy at birth (Women, Men) - 2004	81.4, 76.6
Total labour force (000s) 2005	4 849
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	4.0	3.8	3.8
Consumer price index	3.4	2.9	2.8
Unemployment rate (%)	9.6	9.2	8.8
General government financial balance (% GDP)	-2.6	-2.6	-2.6
Current account balance (% GDP)	-10.8	-10.1	-9.7

Source: OECD

Greece



Brisk growth

The economy grew briskly in 2006 on the back of a strong rebound in investment activity and robust consumption spending. Output growth is expected to continue to grow at around 3.75% over the next two years and unemployment is set to fall further. Headline inflation should decline, as the contribution from oil prices wanes, but remain well above the euro area average. The current account deficit is expected to remain high.

For the first time in many years the authorities may durably bring the deficit below 3% of GDP. However, fiscal objectives should now become more ambitious by aiming for a substantial primary surplus, given the high level of debt and favourable outlook for demand. Moreover, comprehensive reforms of the pension and health care systems are needed to ensure long-run fiscal sustainability.



Hungary

Expenditure cuts needed

For 2006, real GDP is set to grow at a rate near its trend of about 4%. However, weakening domestic demand, due to tight austerity measures, is projected to slow growth in both 2007 and 2008, despite exports continuing to expand strongly.

Given the alarming fiscal imbalance (this year the general government deficit is likely to be over 10% of GDP), the announced frontloading of an austerity package with revenue increases is probably unavoidable. However, for consolidation to break with the Hungarian habit of missing fiscal targets, permanent expenditure cuts linked to structural reforms are needed.



KEY ECONOMIC FORECAST & INDICATORS

Population (000s) 2005	10 087
Area (000 sq km)	93
Currency	Forint
GDP (Billion USD) - 2005	173.3
Life expectancy at birth (Women, Men) - 2004	76.9, 68.6
Total labour force (000s) 2005	4 205
Government type	Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	4.0	2.2	3.0
Consumer price index	3.9	6.7	4.1
Unemployment rate (%)	7.5	7.7	7.6
General government financial balance after reclassification ¹ (% GDP)	-10.1	-6.9	-5.7
Current account balance (% GDP)	-7.3	-6.3	-5.6

¹ After 2007 Eurostat reclassification to exclude defined-contribution funded pension revenues.

Source: OECD



Iceland

Imbalances remain

There are increasing signs that a change in foreign investor sentiment early this year and further policy tightening have set in motion an overdue adjustment process. The economy is projected to contract in the next few quarters. Nonetheless, economic imbalances will remain substantial for some time. The challenge for policymakers will be to ensure that steady progress is made in unwinding these before any renewed financial market nervousness complicates an orderly adjustment.

Further monetary tightening is likely to be needed in the near term both to return inflation to target and anchor expectations there. Fiscal policy should avoid rekindling demand pressures, offsetting the expansionary effect of announced tax cuts by additional spending restraint so long as there is no clear evidence that the economy has cooled down.



Population (000s) 2005	296
Area (000 sq km)	103
Currency	Krona
GDP (Billion USD) - 2005	10.6
Life expectancy at birth (Women, Men) - 2004	82.7, 79.2
Total labour force (000s) 2005	166
Government type	Constitutional Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.6	1.0	2.5
Consumer price index	6.8	3.7	2.7
Unemployment rate (%)	2.8	2.5	3.0
General government financial balance (% GDP)	4.1	0.4	-1.3
Current account balance (% GDP)	-20.6	-13.9	-7.8

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	4 131
Area (000 sq km)	70
Currency	Euro
GDP (Billion USD) - 2005	161.9
Life expectancy at birth (Women, Men) - 2003	80.7, 75.8
Total labour force (000s) 2005	2 015
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	5.1	5.1	4.5
Consumer price index	2.8	2.8	3.0
Unemployment rate (%)	4.4	4.4	4.4
General government financial balance (% GDP)	1.0	0.7	0.7
Current account balance (% GDP)	-1.7	-1.3	-0.4

Source: OECD

Ireland



Boost energy competition

The economy is growing rapidly, propelled by strong household spending. Activity is projected to keep expanding robustly with a mild slowdown in growth from 5% in 2007 to 4.5% in 2008 as the boost that temporary factors are giving to demand fades. Inflation is projected to remain above the euro area average.

Fiscal and regulatory policy should focus on keeping inflation in check. The budget should prioritise spending items that alleviate bottlenecks in the economy, such as investment in human and physical capital, and refrain from fuelling consumption. Boosting competition in network industries, especially in the electricity and natural gas sectors, is becoming a matter of urgency as these sectors contribute disproportionately to inflation.

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	48 294
Area (000 sq km)	100
Currency	Won
GDP (Billion USD) - 2005	1 056.3
Life expectancy at birth (Women, Men) - 2003	80.8, 73.9
Total labour force (000s) 2005	23 743
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	5.0	4.4	4.6
Household savings ratio	3.5	3.2	3.3
Consumer price index	2.5	2.9	3.0
Unemployment rate (%)	3.4	3.4	3.4
General government financial balance (% GDP)	2.2	2.1	2.0
Current account balance (% GDP)	0.3	0.0	-0.4

Source: OECD

Korea



Growth to ease

Output growth is expected to ease from 5% in 2006 to around 4.5% in 2007-08 as a result of less buoyant domestic demand. The significant appreciation of the won is bringing the current account from surplus into balance, while helping to keep inflation in the central bank's medium-term target zone.

Monetary policy should aim at keeping inflation in the target zone over the medium term, while concern over increases in housing prices should be addressed through tax measures and policies to increase supply. Fiscal policy should focus on the medium-term objective of a balanced budget by 2009. The environment for business investment should be improved through regulatory reform, including greater employment flexibility.



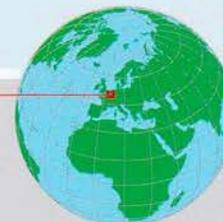
Luxembourg

Financial services prosper

Growth has remained strong for the third year running, reaching a pace of more than 5% in 2006 on the back of strong activity in the financial and business services sector. Exports of financial services have continued to prosper, reflecting the positive sentiment in financial markets. Employment growth has accelerated and become more broad-based. Nevertheless, unemployment continues to rise as most jobs are being filled by cross-border workers, while domestic hires barely keep pace with expanding supply.

To boost job search activity of residents, the access conditions to unemployment benefits should be tightened and unemployment benefit replacement rates gradually reduced after a certain period of benefit receipt. To improve long-term sustainability of public finances, the recent revenue increasing measures should be replaced by expenditure restraint.

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	455
Area (000 sq km)	3
Currency	Euro
GDP (Billion USD) - 2005	30.9
Life expectancy at birth (Women, Men) - 2003	81.0, 75.0
Total labour force (000s) 2005	317
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	5.2	4.3	4.0
Consumer price index	3.3	2.0	2.2
Unemployment rate (%)	4.6	4.7	5.0
General government financial balance (% GDP)	-1.3	-0.8	-0.4

Source: OECD



Mexico

Output to moderate

Output growth is likely to moderate, reflecting weaker public spending and faltering external demand. But private investment and consumption should remain strong, and GDP growth is projected to reach 3.5 to 4% in 2007 and 2008. After turning up in the third quarter of 2006, inflation should come down. With the terms of trade deteriorating, the current account deficit should widen gradually.

Monetary policy is expected to ease in early 2007 once inflation has come down. With less growth and lower oil receipts, the environment for fiscal policy will become more difficult, but the fiscal position should not be allowed to weaken. A reform is needed to widen the tax base with a view to reducing distortions and financing essential spending programmes on a stable basis.



Population (000s) 2005	105 300
Area (000 sq km)	1 996
Currency	Peso
GDP (Billion USD) - 2005	1 134.9
Life expectancy at birth (Women, Men) - 2004	77.6, 72.7
Total labour force (000s) 2005	42 463
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	4.7	3.6	3.7
Consumer price index	3.6	3.6	3.2
Unemployment rate (%)	3.4	3.4	3.4
Current account balance (% GDP)	-0.2	-1.0	-1.4

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Netherlands



Demand recovers

The economy continues to recover, with GDP growth rising to 3% in 2006. Exports are benefiting from strong world demand and improving competitiveness. Domestic demand is finally picking up as private consumption is underpinned by a stronger labour market. Inflation is low, but core inflation is expected to pick up gradually along with higher wage growth.

The fiscal position has considerably improved, but could be further strengthened by phasing out mortgage-interest subsidies, helping to soften strong demand pressures in the housing market. Moreover, further measures should be taken to increase the labour force participation rate of disabled workers, which shows no improvement.

Population (000s) 2005	16 320
Area (000 sq km)	41
Currency	Euro
GDP (Billion USD) - 2005	558.1
Life expectancy at birth (Women, Men) - 2004	81.4, 76.9
Total labour force (000s) 2005	8 345
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.0	3.1	3.0
Household savings ratio	7.0	6.0	4.9
Consumer price index	1.5	1.0	1.9
Unemployment rate (%)	4.9	4.2	3.1
General government financial balance (% GDP)	-0.4	-0.2	-0.1
Current account balance (% GDP)	7.4	7.7	9.3

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



New Zealand



Export-led shift

The economy has slowed over the course of the year, serving to eliminate excess demand pressures. The projected pick-up in the pace of activity is likely to be modest, as the shift towards export-led growth is hampered by the exchange rate appreciation since the middle of the year. Nevertheless, moderate real disposable income growth will allow private consumption to gently accelerate. Employment is projected to stabilise, but the rise in the unemployment rate will be attenuated by some labour market withdrawal.

The emerging negative output gap and dissipating inflationary pressures would allow room for significant monetary policy easing next year, which could also induce a currency depreciation and thereby reduce the external imbalance over time. But additional fiscal stimulus, whether in the form of tax cuts or additional spending, would reduce the room for lower interest rates and inhibit the transition to export-led growth. This would make the challenges of macroeconomic stabilisation more difficult at a time when the outlook is subject to considerable risks.

Population (000s) 2005	4 099
Area (000 sq km)	269
Currency	Dollar
GDP (Billion USD) - 2005	104.5
Life expectancy at birth (Women, Men) - 2004	81.3, 77.0
Total labour force (000s) 2005	2 161
Government type	Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	1.5	1.3	2.0
Consumer price index	3.6	2.8	2.0
Unemployment rate (%)	3.8	4.4	4.6
General government financial balance (% GDP)	3.5	2.6	2.2
Current account balance (% GDP)	-9.3	-8.4	-8.3

Source: OECD



Norway

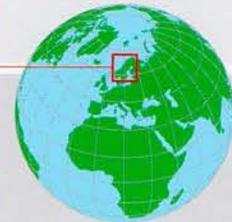
Overheating?

Mainland Norway (i.e., not including offshore oil and gas extraction) is booming. Real GDP growth is projected to have reached 3.75% in 2006, and to moderate slightly in 2007 and 2008 reflecting the completion of major oil investment projects, reduced monetary stimulus and slowing household demand. Although the output gap has become increasingly positive, underlying inflation has remained relatively low and below the Norges Bank target.

After more than three years of growth above potential, there are signs of overheating. Rising bottlenecks and increasing risks of wage inflation call for a stricter fiscal policy, a faster return to a neutral monetary stance and new reforms to boost labour supply.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	4 623
Area (000 sq km)	324
Currency	Krone
GDP (Billion USD) - 2005	199.5
Life expectancy at birth (Women, Men) - 2004	82.3, 77.5
Total labour force (000s) 2005	2 400
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	2.4	3.2	2.7
Household savings ratio	5.2	5.6	5.9
Consumer price index	2.2	1.7	2.6
Unemployment rate (%)	3.6	3.3	3.4
General government financial balance (% GDP)	19.3	18.0	18.1
Current account balance (% GDP)	20.0	20.2	21.5

Source: OECD



Poland

Improving steadily

Economic performance has been improving steadily, with growth of 5% combined with low inflation and plunging unemployment. Continuing strength in investment and exports should support robust growth in 2007 and 2008. Job creation is projected to maintain its recent momentum and to make significant further inroads in unemployment. Productivity gains are projected to be moderate and, with rather faster wage increases, costs may push inflation towards the official target of 2.5%.

With a vigorous expansion well established and inflation set to move higher, an expected monetary tightening in 2007 will be appropriate. The projected fiscal outcome for 2006 is encouraging, but budgetary consolidation and rationalisation of expenditure planning need to be pursued further to take full advantage of higher growth.



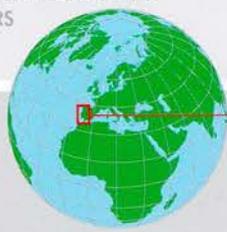
Population (000s) 2005	38 161
Area (000 sq km)	313
Currency	Zloty
GDP (Billion USD) - 2005	487.3
Life expectancy at birth (Women, Men) - 2005	79.2, 70.7
Total labour force (000s) 2005	17 218
Government type	Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	5.1	5.1	4.8
Consumer price index	1.4	1.9	2.3
Unemployment rate (%)	14.2	12.6	11.3
General government financial balance after reclassification* (% GDP)	-4.1	-3.8	-3.6
Current account balance (% GDP)	-2.1	-1.9	-1.5

* After 2007 Eurostat reclassification to exclude defined-contribution funded pension revenues.

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	10 563
Area (000 sq km)	92
Currency	Euro
GDP (Billion USD) - 2005	209.9
Life expectancy at birth (Women, Men) - 2003	80.5, 74.2
Total labour force (000s) 2005	5 545
Government type	Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	1.3	1.5	1.7
Household savings ratio	9.4	9.5	9.7
Consumer price index	3.1	2.0	1.8
Unemployment rate (%)	7.5	7.4	7.0
General government financial balance (% GDP)	-4.6	-3.7	-3.4
Current account balance (% GDP)	-8.8	-9.2	-9.9

Source: OECD

Portugal



Spending discipline needed

Stronger growth in Europe spurred a pick-up in exports and GDP growth in 2006. The recovery is expected to gain momentum in 2007 and 2008. The significant output gap and high unemployment should lead to a moderation in wage claims and reduce inflation to the euro area average.

It is imperative that the government achieves its fiscal consolidation goals, which will require strong discipline on the expenditure side. This will contribute to long-term improvement in economic performance. Lifting the level of human capital and increasing competition in the domestic market are also essential for raising productivity and improving Portugal's flexibility to adapt to external shocks.

Slovak Republic



Export motors

Net exports are projected to rise markedly as production builds up at new automobile plants, pushing economic growth up to around 8% in 2006 and again in 2007. Unemployment is likely to continue to fall, albeit more slowly than in recent years. Headline inflation should decline to 2.25% by 2008.

Further monetary policy tightening may be needed to ensure that inflation targets are met. Greater fiscal consolidation in 2007 would both help to damp inflationary pressures and create a larger safety margin for respecting the Maastricht fiscal criteria. Labour market reforms are needed to bring the long-term unemployed back into employment.

KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	5 387
Area (000 sq km)	49
Currency	Koruna
GDP (Billion USD) - 2005	81
Life expectancy at birth (Women, Men) - 2004	77.8, 70.3
Total labour force (000s) 2005	2 646
Government type	Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	8.2	8.0	5.7
Consumer price index	4.5	2.8	2.2
Unemployment rate (%)	13.5	12.2	11.7
General government financial balance (% GDP)	-3.7	-2.7	-2.2
Current account balance (% GDP)	-6.4	-3.9	-3.3

Source: OECD



Spain

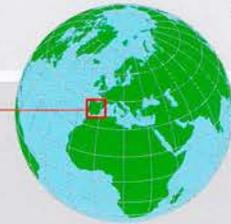
Competitiveness challenge

Output growth, which reached 3.7% in 2006, should moderate somewhat in 2007 and 2008 as monetary conditions tighten and exports are expected to weaken. It will remain robust, however, pushing the unemployment rate to below 8%. With inflation stabilising at around 3%, the differential with the euro area is unlikely to shrink significantly, implying a further erosion of international competitiveness.

A more restrictive fiscal policy would be useful not only in reducing domestic demand pressures that have fed into inflation, but also in preparing for the fiscal consequences of ageing. However, reducing the inflation differential will still require structural reforms that foster competition in sheltered sectors and limit the use of indexation clauses in wage agreements. Lowering the country's energy intensity of production would reduce longer-term vulnerability to oil-price shocks.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	43 398
Area (000 sq km)	505
Currency	Euro
GDP (Billion USD) - 2005	1 182.6
Life expectancy at birth (Women, Men) - 2004	83.8, 77.2
Total labour force (000s) 2005	20 886
Government type	Parliamentary Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.7	3.3	3.1
Household savings ratio	10.0	10.1	10.0
Consumer price index	3.5	2.7	3.2
Unemployment rate (%)	8.4	7.8	7.6
General government financial balance (% GDP)	1.4	1.2	1.4
Current account balance (% GDP)	-8.8	-9.2	-9.6

Source: OECD



Sweden

Dynamic

The Swedish economy is growing dynamically, driven in particular by domestic demand. With growth projected to be 4.3% this year and 3.6% next, the output gap will be pushed further into positive territory. Although labour shortages are visible in construction, wage growth is not yet picking up. Underlying inflation remains at very low levels but is expected to rise over the projection period.

Fiscal policy adds some stimulus to an already vibrant economy next year, but monetary policy is becoming less expansionary. To counter the risk of overheating, the central bank should increase policy rates to at least neutral levels and fiscal policy should avoid fuelling the economy.



Population (000s) 2005	9 030
Area (000 sq km)	450
Currency	Krona
GDP (Billion USD) - 2005	295.1
Life expectancy at birth (Women, Men) - 2004	82.7, 78.4
Total labour force (000s) 2005	4 622
Government type	Constitutional Monarchy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	4.3	3.6	2.9
Household savings ratio	7.8	7.1	7.0
Consumer price index	1.4	2.2	2.5
Unemployment rate (%)	5.5	5.3	4.3
General government financial balance (% GDP)	2.9	2.4	2.6
Current account balance (% GDP)	7.1	7.5	7.6

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Switzerland



Resist complacency

Economic growth, which should reach about 3% in 2006, is likely to slow in 2007 and 2008 in a context of tighter monetary policy and a slightly less buoyant international environment. GDP will continue to rise more rapidly than potential output however, which should entail a further reduction in unemployment. Inflationary pressures seem likely to remain low, however.

With the economy still growing strongly, the gradual tightening of monetary policy towards more neutral conditions should continue. Steps will also have to be taken to keep social spending under control and maintain healthy public finances. Recent economic results, though encouraging, must not lead to complacency: potential growth needs to be strengthened, which requires the pursuit of reforms to stimulate competition and boost productivity.

Population (000s) 2005	7 438
Area (000 sq km)	41
Currency	Franc
GDP (Billion USD) - 2005	271.3
Life expectancy at birth (Women, Men) - 2004	83.7, 78.6
Total labour force (000s) 2005	4 371
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	3.0	2.2	2.0
Consumer price index	1.0	0.9	1.2
Unemployment rate (%)	3.9	3.6	3.3
General government financial balance (% GDP)	0.2	0.5	0.7
Current account balance (% GDP)	15.3	16.6	17.9

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



Turkey



Reform agenda

The economy was hit hard by the May-June 2006 turmoil in international markets, which served to underscore its remaining vulnerabilities, but has recovered rather rapidly. The current account deficit, which will likely reach a historically high level above 8% of GDP in 2006, continues to be financed by growing private debt and foreign direct investment. Strong GDP growth is expected to continue but risks remain.

Maintaining fiscal discipline is crucial, while monetary policy credibility needs to be bolstered, in particular by consolidating the independence of the central bank. The transparency and quality of fiscal institutions need to be strengthened by adopting international accounting standards and multi-year spending targets for general government. Additional structural reforms are required to enhance the competitiveness of the economy, promote the formal sector and rein in the high current account deficit.

Population (000s) 2005	72 064
Area (000 sq km)	781
Currency	Lira
GDP (Billion USD) - 2005	586.7
Life expectancy at birth (Women, Men) - 2004	73.6, 68.8
Total labour force (000s) 2005	25 065
Government type	Republican Parliamentary Democracy

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	6.1	5.3	6.3
Consumer price index	9.6	7.9	5.7
Unemployment rate (%)	10.1	9.8	9.5
Current account balance (% GDP)	-8.1	-7.6	-7.0

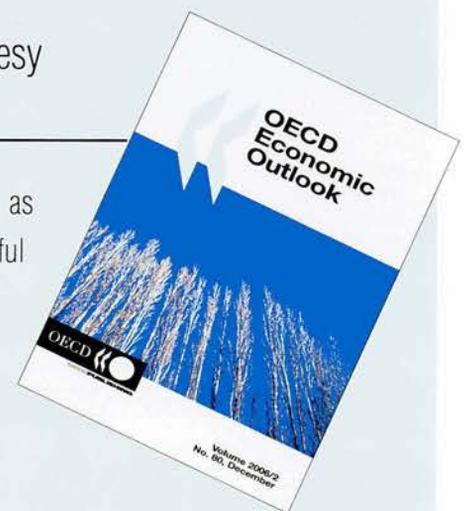
Source: OECD

Note about the OECD Observer snapshots: All GDP values in the tables are at current market prices. Data in the lower tables come from the *OECD Economic Outlook* preliminary edition. For the upper tables, sources include *OECD in Figures*, *OECD Main Economic Indicators* and other sources.

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Brazil

Good export performance

Activity is showing signs of recovery, following a slowing in the second quarter. Private consumption continues to be strong, and investment is likely to bounce back. The trade and current account surpluses remain robust on the back of sustained good export performance. Financial conditions have been benign, even during the pre-election period, buttressed by a continued improvement in external vulnerability indicators.

The policy mix is becoming more accommodating. Sustained disinflation and the lacklustre GDP readings have prompted continued monetary easing. The exchange rate was under some pressure in May-June but has stabilised since then. Fiscal policy is on track, with the end-period targets expected to be met despite the ratcheting-up of current expenditure, especially on pensions.

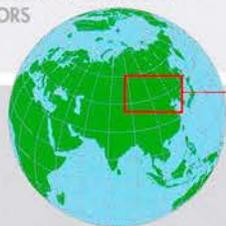


Population (000s) 2005	184 184
Area (000 sq km)	8 515
Currency	Réal
GDP (Billion USD) - 2005	796
Life expectancy at birth (Women, Men) - 2005	75.8, 68.2
Total labour force (000s) 2005	96 032
Government type	Federal Republic

	2006	2007	2008
	% change unless otherwise indicated		
Real GDP growth	3.1	3.8	4.0
Inflation (CPI)	3.0	3.8	3.6
Fiscal balance (% of GDP)	-2.5	-1.5	-1.0
Primary fiscal balance (% of GDP)	4.3	4.3	4.3
Current account balance (% GDP)	1.6	0.9	0.4

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



China



Moderating in 2007

After growing very rapidly in the first half of the year, GDP slowed somewhat in the second half as fiscal and monetary policy exerted a dampening impact on activity. Nevertheless, growth in 2006 may still be around 10.5%. The moderate slowing is projected to continue in the first half of 2007 as export growth slackens and the impact of policy tightening is felt, but thereafter growth may pick up again, resulting in the economy growing in line with potential of somewhat more than 10% by 2008. Despite imports accelerating and exports slackening, the current account surplus is projected to rise continuously, reaching \$285 billion (8.8% of GDP) by 2008. As supply increases in line with demand, inflation will remain subdued at 2% during the projection period.

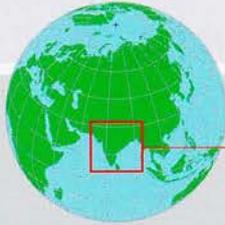
A combination of further exchange rate appreciation and some relaxation of fiscal policy would help to shift demand from net foreign trade to domestic demand and reduce the external surplus. Tax reforms, such as unifying the corporate tax rate for domestic and foreign companies at a low level and reducing taxation of investment would make the tax system less distorting and help to sustain growth over the longer term.

Population (000s) 2005	1 307 560
Area (000 sq km)	9 597
Currency	Renminbi
GDP (Billion USD) - 2005	2 234
Life expectancy at birth (Women, Men) - 2004	73.0, 70.0
Total labour force (000s) 2005	778 770
Government type	Communist state

	2006	2007	2008
	% change unless otherwise indicated		
Real GDP growth	10.6	10.3	10.7
Inflation	2.2	1.8	2.0
Consumer price index	1.4	1.0	1.1
Fiscal balance (% of GDP)	1.5	1.0	0.9
Current account balance (% GDP)	8.3	8.5	8.8

Source: OECD

KEY ECONOMIC FORECAST & INDICATORS



India



Signs of overheating

The economy grew very rapidly at the beginning of fiscal year 2006, expanding by close to 9%, after rapid growth during the previous year. Some signs of overheating have emerged: inflation has picked up to over 6%, though food prices are in part responsible for this movement; and the current account moved into a deficit of 1.3% of GDP in fiscal year 2005 and is likely to widen somewhat in fiscal year 2006. Agricultural output may weaken slightly bringing growth down to 8% in fiscal year 2006. In 2007 and 2008, the effects of the current tightening in monetary growth should be felt, slowing growth to 7% by the end of the projection period and ensuring that inflation moderates slightly, to around 5%.

At this stage of the business cycle, the authorities need to avoid a pro-cyclical fiscal policy in which unexpected revenue gains are largely absorbed by increased government spending. Cyclical strength of revenues should result in the budget deficit falling within the targets set by the Fiscal Responsibility and Budget Management Act. Monetary policy needs to ensure that broad indicators of inflation stay below 5%, in line with the shared target of the central bank and the government.

Population (000s) 2005	1 091 000
Area (000 sq km)	3 287
Currency	Rupee
GDP (Billion USD) - 2005	633
Life expectancy at birth (Women, Men) - 2004	64.0, 63.0
Total labour force (000s) 2004	451 733
Government type	Democracy

	2006	2007	2008
	% change unless otherwise indicated		
Real GDP growth	8.0	7.5	7.0
Inflation	5.0	5.5	5.2
Consumer price index	6.1	5.8	5.5
Short-term interest rate	7.3	7.7	7.7
Fiscal balance (% of GDP)	-6.7	-6.3	-6.0
Current account balance (% GDP)	-1.7	-1.7	-1.8

Source: OECD



Russia

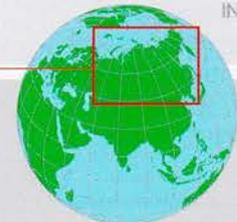
Fairly robust

Real GDP growth will remain fairly robust, though moderating gradually over the projection period as the impulse from recent terms-of-trade gains diminishes. Growth will continue to be driven mainly by consumption, but investment growth is also expected to be relatively strong. Inflation is likely to decline despite continued rapid money-supply growth, as rising confidence in the rouble contributes to the rapid growth of money demand. However, inflationary pressures are likely to abate only gradually, given the government's plans for further spending increases in 2007.

Fiscal discipline remains the key to bringing down inflation, while limiting the speed of exchange-rate appreciation. The fiscal easing now underway, which is to continue through 2007, is thus a concern. However, the finance ministry's efforts to create a more elaborate, rules-based framework for managing the budget and the Stabilisation Fund should improve the prospects for maintaining fiscal discipline over the longer term.



KEY ECONOMIC FORECAST & INDICATORS



Population (000s) 2005	142 800
Area (000 sq km)	17 098
Currency	Rouble
GDP (Billion USD) - 2005	762.6
Life expectancy at birth (Women, Men) - 2004	72.3, 58.9
Total labour force (000s) 2005	73 811
Government type	Federation

	2006	2007	2008
	% change unless otherwise indicated		
GDP growth	6.8	6.0	5.5
Inflation	9.0	8.5	7.2
Fiscal balance (% of GDP)	6.7	4.6	3.3
Current account balance (% GDP)	10.7	7.1	4.5

Source: OECD



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10

The SOARING eagle

Poland has just marked 10 years as a member of the OECD. It has made considerable progress, but more is needed to speed up convergence with the most advanced European economies.

Vincent Koen
OECD Economics Department

Back in the mid-1990s, the mood in Warsaw was buoyant. The favourite metaphor for the Polish economy of the then minister of finance was that of “the soaring eagle of Europe”.

Today, two and half years after EU accession, growth is running strong enough to again warrant flattering metaphors. In the meantime, however, Poland’s growth performance has been somewhat disappointing. Now that activity is soaring anew, the challenge is to ensure that the upswing turns into a sustained catch-up. This requires a number of reforms, many of which are spelled out in the most recent *OECD Economic Survey of Poland*, released a few months ago.

Since Poland joined the OECD, real GDP growth has on average exceeded 4% per annum, as against 2.75% OECD-wide, 3.75% for the other new EU member states and barely over 2% for the EU15. As a result, income per capita, valued at purchasing power parity, rose from below 40% of the OECD average in the mid-1990s to almost 50% today.

While the income gap has narrowed, it remains wide. Upon OECD accession, Poland was the third poorest OECD member, ahead of Mexico and Turkey and, today, this ranking is unchanged. In fact, while Poland did catch up during the 1990s, it subsequently lost momentum, especially when compared with some of the other, smaller new EU countries, where convergence has been making faster headway.

However, since mid-2005 or so, the Polish economy has been expanding at its potential rate or even a bit faster and this newfound dynamism is not expected to falter over the near term. Encouragingly, investment is booming, following a protracted spell of much-depleted under-investment.

Equally spectacular and at least as welcome is the stunningly rapid decline in unemployment over the past few quarters. Indeed, after hovering for five years between 18 and 20%, the unemployment rate has plummeted since late 2005. Its level remains the highest among OECD countries but it is projected to decline further. Granted, emigration, early retirements and a growing number of full-time students are helping. But the improvement also reflects a strong pick-up in employment, which is now expanding faster than ever since Poland joined the OECD.

Even though apparent labour market slack is rapidly diminishing, inflation has stayed very subdued, well below the mid-point of the National Bank of Poland’s 1.5-3.5% target range. In fact it is low—if somewhat volatile—by OECD standards and especially in comparison with other catch-up economies.

Another pleasant surprise this year has been the faster-than-expected decline in the fiscal deficit. Like in many other OECD countries, revenues have come in more abundantly than foreseen. While this constitutes an improvement, it is partly cyclical, and it is not sufficient.

With a gross public debt ratio that is far below the OECD average, with a major pension reform successfully implemented back in 1999, and given the government’s intention to bring down the deficit below the Maastricht threshold by 2009, some question the need for more rapid fiscal adjustment.

Yet, on current policies, even with growth of around 5% per annum, the public debt ratio is set to rise, because of the spending pressures.

To achieve lasting and better fiscal consolidation, the ZŁ30 billion (less than € 8 billion) nominal state budget deficit ceiling used as an anchor by the government should be complemented by a multi-year framework spelling out expenditure priorities, with limits on overall public spending.

Specifically, spending on social transfers ought to be reduced so as to make room for other priorities, notably health and long-term care, child care, education and active labour market measures.

Mainstreaming the social security regime for farmers is one of the main recommendations, and should be easier now that the rural sector receives substantially more income from the EU Common Agricultural Policy.

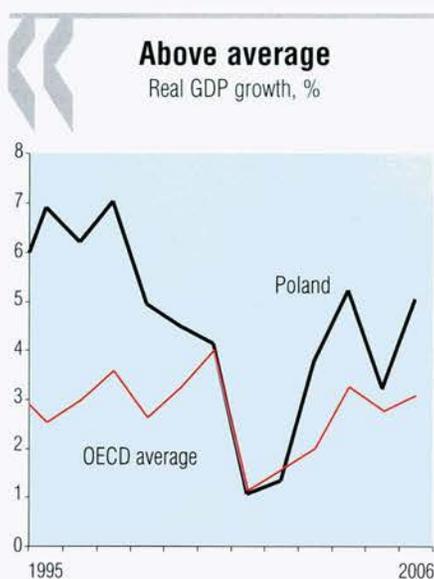
There is also a need to simplify the tax system and to reduce administration costs. As part of the streamlining, the tax base should be broadened as much as possible, by curtailing special provisions and exemptions.

Furthermore, it is important to bring down the very high tax wedge (that is, the gap between wage costs to employers and wages paid to workers), especially for low income earners, so as to reduce the disincentives to take up a job. The government package involving a cut in payroll taxes sent to Parliament a few months ago was a step in this direction.

Another important avenue to raise labour utilisation is to promote internal geographical mobility—international mobility is already remarkably high. This can be achieved by continuing to upgrade transport and communications, and by improving the national integration of the public employment service. A more fluid housing market would also help.

Turning to human capital, a number of education reforms were introduced during the 1990s. Partly as a result, the quality of compulsory education has improved, but from comparatively modest levels. One way to make further progress would be to encourage the pre-schooling of children under six.

Tertiary education has expanded tremendously over the past 15 years, from 400,000 students, all in the public sector, to 2 million, with many in private institutions. This surely helps lift productivity, but problems of co-ordination and mismatch of resources



Source: OECD

Poland should step up privatisation and step back from the temptation of “economic patriotism”.

endure, both between public and private institutions and among students. A state body has been created to monitor the quality of higher education institutions. This makes for more transparency and better quality. However, quality control and information dissemination need to be reinforced. Equity and efficiency would both benefit if tuition fees for full-time students in public higher-education institutions were introduced, alongside improved systems of means-tested grants and student loans with income-contingent repayments.

Adult training is key in a rapidly changing economy, but Polish firms are less active in that respect than in most other OECD countries, and a large share of the training is financed by the employees themselves. Moreover, training is in practice mostly benefiting younger and more educated persons.

Productivity can also be boosted through better product market regulation and intensified competition. One dimension

of the problem is corruption. The efforts underway to eradicate it are important, since it holds back potential investment, both domestic and foreign.

Last but not least, productivity could be raised by reducing public ownership further. It remains very high compared with the other OECD countries, at the expense of investment in R&D and physical capital. The OECD's advice is therefore to step up privatisation and to step back from the temptation of “economic patriotism”, which tends to dress up what are in effect incumbent producers' private interests as public or security concerns.

To sum up, Poland's convergence may have been slower than in some of the other catch-up countries so far, but it has certainly been very real. The current auspicious economic environment and comfortable external position of the Polish economy make it the best of times to push through the more ambitious reforms. ■

This article is based on a speech delivered by Vincent Koen, Counsellor in the Economics Department, at a conference celebrating Poland's first decade as an OECD member in Warsaw on 23 November 2006. The full 2,800 word version is available at www.oecd.org/speeches or can be requested at observer@oecd.org

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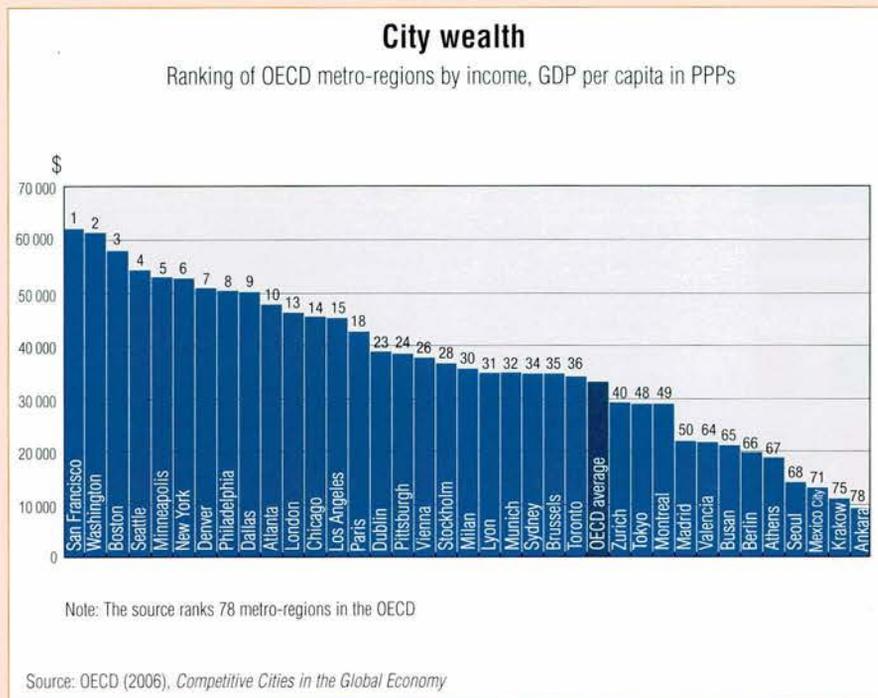


Power Machines

City pretty

Dynamic countries tend to have a fast-growing and competitive city at their hub, even if cities accumulate social and economic disorders as well. San Francisco is the wealthiest in a new OECD ranking of 78 metropolitan regions, with income of \$62,350 per head, adjusted for purchasing power parity. Ankara was the poorest, with \$9,551. The top 10 are all located in the US, with London (13th), Paris (18th) and Dublin (24th) being the only non-American cities to make it into the top 25. The ranking largely reflects differences in national GDP and GDP per capita among OECD countries, though Tokyo just scrapes into the top 50.

In today's networked world, major cities typically interact as much with each other as with their own countries. Now, richer metro-regions face increased competition from less wealthy ones. In 1995-2002, relatively lower-income metropolitan regions, like the Korean port of Busan, or Istanbul, Prague and Warsaw, grew faster in



wealth than Tokyo, Frankfurt or Vienna. Berlin, Budapest, Barcelona and Oslo even saw their average annual growth rates fall during the same period. Nevertheless, ongoing research by OECD experts so far

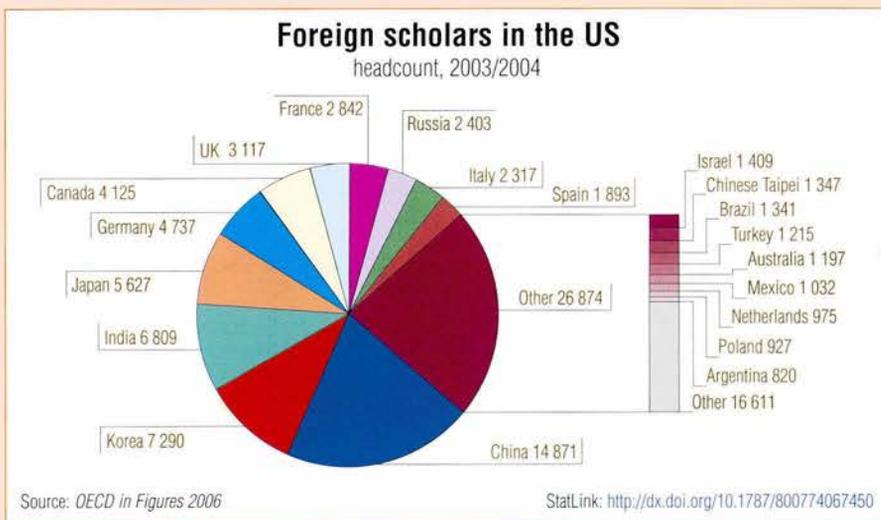
suggests that the benefits of globalisation are increasingly concentrated in the richest metro-regions. ■

OECD (2006) *Competitive Cities in the Global Economy*, ISBN 92-64-02708-4

Foreign class

Some 82,900 foreign scholars were in teaching or research at US higher education institutions in the 2003-04 academic year. Most were engaged in research, although the share in teaching has increased. Two-thirds are engaged in scientific or engineering fields, with a fast-growing proportion in life and biological sciences.

Just 20 countries account for 80% of foreign scholars in the US. Almost half were from a non-OECD country and a quarter came from the EU. China was the first country of origin and Asia the first region. Around 18% of non-US scholars were Chinese, around 8% were Korean or Indian and more than 6% were Japanese. Among European countries, Germany, France, the UK, Italy and Spain each provided between 2% and 6% of foreign academic staff. In addition, Canada and Russia accounted for 5% and almost 3% of the total, respectively.



A large number of Asian academics already worked in US universities in the mid-1990s, but the rate of academic mobility has grown. For every 100 scholars working at home in most OECD countries, there are at least two holding positions in US universities. But such academic mobility is

higher from Korea (13%), Russia (8%) and Chinese Taipei (6%). In contrast, mobility from European countries has slowed. In 2003/04 female academics accounted for a third of foreign scholars in the US. ■

OECD Science, Technology and Industry Outlook 2006, ISBN 926402848X

Indicators

			% change from:				level:	
			previous period	previous year			current period	same period last year
Australia 	Gross domestic product	Q2 06	0.3	1.9	Current balance	Q3 06	-9.17	-9.90
	Leading indicator	Sep. 06	0.6	2.8	Unemployment rate	Oct. 06	4.60	5.20
	Consumer price index	Q3 06	0.9	3.9	Interest rate	Oct. 06	6.28	5.63
Austria 	Gross domestic product	Q3 06	0.9	3.3	Current balance	Q4 05	1.70	-0.07
	Leading indicator	Oct. 06	0.6	10.5	Unemployment rate	Oct. 06	4.70	5.20
	Consumer price index	Oct. 06	-0.2	1.0	Interest rate		*	*
Belgium 	Gross domestic product	Q3 06	0.6	3.1	Current balance	Q2 06	3.98	5.02
	Leading indicator	Oct. 06	0.5	5.7	Unemployment rate	Oct. 06	8.30	8.40
	Consumer price index	Nov. 06	0.2	1.5	Interest rate		*	*
Canada 	Gross domestic product	Q3 06	0.4	2.5	Current balance	Q2 06	3.74	4.73
	Leading indicator	Oct. 06	0.9	4.5	Unemployment rate	Nov. 06	6.30	6.40
	Consumer price index	Oct. 06	-0.2	0.9	Interest rate	Nov. 06	4.32	3.29
Czech Republic 	Gross domestic product	Q2 06	1.2	6.5	Current balance	Q2 06	-2.45	-1.48
	Leading indicator	Oct. 06	1.0	10.9	Unemployment rate	Oct. 06	6.90	7.90
	Consumer price index	Oct. 06	-0.5	1.3	Interest rate	Nov. 06	2.64	2.24
Denmark 	Gross domestic product	Q3 06	0.6	3.8	Current balance	Q2 06	0.60	1.61
	Leading indicator	Oct. 06	0.5	0.3	Unemployment rate	Sept. 06	3.50	4.60
	Consumer price index	Oct. 06	-0.1	1.5	Interest rate	Nov. 06	3.66	2.31
Finland 	Gross domestic product	Q2 06	1.9	6.6	Current balance	Sept. 06	0.68	1.03
	Leading indicator	Oct. 06	0.0	-2.0	Unemployment rate	Oct. 06	7.90	8.30
	Consumer price index	Oct. 06	0.3	1.8	Interest rate		*	*
France 	Gross domestic product	Q3 06	0.0	1.8	Current balance	Sept. 06	-2.63	-2.50
	Leading indicator	Oct. 06	0.2	2.3	Unemployment rate	Oct. 06	8.80	9.90
	Consumer price index	Oct. 06	-0.2	1.1	Interest rate		*	*
Germany 	Gross domestic product	Q3 06	0.6	2.8	Current balance	Q3 06	28.97	29.18
	Leading indicator	Oct. 06	0.5	5.3	Unemployment rate	Oct. 06	8.20	9.20
	Consumer price index	Oct. 06	0.1	1.1	Interest rate		*	*
Greece 	Gross domestic product	Q3 06	2.2	4.4	Current balance	Sept. 06	-2.29	-1.51
	Leading indicator	Oct. 06	0.2	5.2	Unemployment rate	Jun. 06	9.00	9.90
	Consumer price index	Oct. 06	0.6	2.8	Interest rate		*	*
Hungary 	Gross domestic product	Q2 06	1.0	4.2	Current balance	Q2 06	-1.51	-1.53
	Leading indicator	Oct. 06	1.5	10.7	Unemployment rate	Oct. 06	7.90	7.50
	Consumer price index	Oct. 06	0.5	6.4	Interest rate	Nov. 06	8.11	6.13
Iceland 	Gross domestic product	Q2 06	2.0	2.6	Current balance	Q3 06	-1.19	-0.72
	Leading indicator		Unemployment rate	Oct. 06	1.20	1.70
	Consumer price index	Nov. 06	0.0	7.3	Interest rate	Oct. 06	14.25	9.77
Ireland 	Gross domestic product	Q2 06	0.9	4.9	Current balance	Q2 06	-2.04	-1.64
	Leading indicator	Oct. 06	0.1	10.9	Unemployment rate	Oct. 06	4.20	4.40
	Consumer price index	Oct. 06	0.0	3.9	Interest rate		*	*
Italy 	Gross domestic product	Q3 06	0.3	1.7	Current balance	Jun. 06	-1.23	-0.03
	Leading indicator	Oct. 06	-0.2	-0.2	Unemployment rate	Jun. 06	6.80	7.70
	Consumer price index	Nov. 06	0.1	1.8	Interest rate		*	*
Japan 	Gross domestic product	Q3 06	0.5	2.7	Current balance	Sept. 06	12.02	13.88
	Leading indicator	Oct. 06	0.2	-0.5	Unemployment rate	Oct. 06	4.10	4.50
	Consumer price index	Oct. 06	-0.2	0.4	Interest rate	Nov. 06	0.40	0.03
Korea 	Gross domestic product	Q3 06	0.9	4.7	Current balance	Oct. 06	0.72	1.45
	Leading indicator	Oct. 06	1.5	10.7	Unemployment rate	Oct. 06	3.50	3.90
	Consumer price index	Nov. 06	-0.6	2.2	Interest rate	Oct. 06	4.57	3.93

			% change from:				level:	
			previous period	previous year			current period	same period last year
 Luxembourg	Gross domestic product	Q2 06	3.1	5.4	Current balance	Q2 06	1.34	0.84
	Leading indicator	Oct. 06	1.0	10.4	Unemployment rate	Oct. 06	4.90	4.70
	Consumer price index	Oct. 06	-0.3	1.5	Interest rate		*	*
 Mexico	Gross domestic product	Q3 06	1.0	4.6	Current balance	Q3 06	-1.67	-0.88
	Leading indicator	Oct. 06	-0.7	0.2	Unemployment rate	Oct. 06	3.80	3.40
	Consumer price index	Oct. 06	0.4	4.3	Interest rate	Nov. 06	7.16	8.76
 Netherlands	Gross domestic product	Q3 06	0.6	2.9	Current balance	Q3 06	20.64	10.40
	Leading indicator	Oct. 06	0.3	4.7	Unemployment rate	Oct. 06	3.90	4.60
	Consumer price index	Oct. 06	-0.3	0.9	Interest rate		*	*
 New Zealand	Gross domestic product	Q2 06	0.4	1.6	Current balance	Q2 06	-2.20	-2.30
	Leading indicator	Sep. 06	-0.6	-3.3	Unemployment rate	Q3 06	3.80	3.60
	Consumer price index	Q3 06	0.7	3.5	Interest rate	Nov. 06	7.61	7.54
 Norway	Gross domestic product	Q2 06	0.5	2.1	Current balance	Q2 06	16.84	10.46
	Leading indicator	Oct. 06	1.0	5.4	Unemployment rate	Sept. 06	3.30	4.70
	Consumer price index	Oct. 06	0.1	2.7	Interest rate	Nov. 06	3.62	2.54
 Poland	Gross domestic product	Q3 06	2.6	5.9	Current balance	Sept. 06	0.05	-0.61
	Leading indicator	Oct. 06	0.0	9.5	Unemployment rate	Oct. 06	14.00	17.20
	Consumer price index	Oct. 06	0.1	1.2	Interest rate	Oct. 06	4.20	4.62
 Portugal	Gross domestic product	Q2 06	0.9	0.9	Current balance	Aug. 06	-1.34	-1.56
	Leading indicator	Oct. 06	0.6	5.9	Unemployment rate	Oct. 06	7.20	7.80
	Consumer price index	Oct. 06	0.1	2.7	Interest rate		*	*
 Slovak Republic	Gross domestic product	Q3 06	2.6	9.0	Current balance	Q2 06	-0.72	-0.87
	Leading indicator	Oct. 06	-0.3	1.9	Unemployment rate	Oct. 06	12.70	15.90
	Consumer price index	Oct. 06	0.2	3.7	Interest rate	Oct. 06	6.55	6.11
 Spain	Gross domestic product	Q3 06	0.9	3.8	Current balance	Jul. 06	-9.46	-5.70
	Leading indicator	Oct. 06	0.0	0.0	Unemployment rate	Oct. 06	8.40	8.80
	Consumer price index	Oct. 06	0.4	2.5	Interest rate		*	*
 Sweden	Gross domestic product	Q3 06	1.0	4.7	Current balance	Q3 06	7.53	7.07
	Leading indicator	Sep. 06	0.5	5.3	Unemployment rate	Mar. 05	6.30	6.30
	Consumer price index	Oct. 06	0.0	1.3	Interest rate	Nov. 06	2.90	1.51
 Switzerland	Gross domestic product	Q3 06	0.4	2.4	Current balance	Q2 06	15.57	15.55
	Leading indicator	Oct. 06	1.0	4.1	Unemployment rate	Q3 06	3.90	4.50
	Consumer price index	Nov. 06	0.0	0.5	Interest rate	Oct. 06	1.86	0.85
 Turkey	Gross domestic product	Q2 06	17.0	7.5	Current balance	Q2 06	-9.31	-6.09
	Leading indicator	Oct. 06	-1.5	-2.2	Unemployment rate	Aug. 06	9.10	9.40
	Consumer price index	Nov. 06	1.3	9.9	Interest rate	Oct. 06	18.38	13.78
 United Kingdom	Gross domestic product	Q3 06	0.7	2.7	Current balance	Q2 06	-12.76	-2.93
	Leading indicator	Oct. 06	0.2	1.1	Unemployment rate	Aug. 06	5.60	4.70
	Consumer price index	Oct. 06	0.1	3.7	Interest rate	Oct. 06	5.09	4.53
 United States	Gross domestic product	Q3 06	0.5	3.0	Current balance	Q2 06	-218.41	-193.26
	Leading indicator	Oct. 06	0.1	2.9	Unemployment rate	Oct. 06	4.40	4.90
	Consumer price index	Oct. 06	-0.5	1.3	Interest rate	Nov. 06	5.32	4.31
 Euro area	Gross domestic product	Q3 06	0.5	2.7	Current balance	Sept. 06	-0.33	-7.88
	Leading indicator	Oct. 06	0.3	3.3	Unemployment rate	Oct. 06	7.70	8.50
	Consumer price index	Oct. 06	0.1	1.6	Interest rate	Nov. 06	3.60	2.36

Definitions and notes

Gross Domestic Product: Volume series; seasonally adjusted except for Luxembourg, Poland and Turkey; **Leading Indicators:** A composite indicator based on other indicators of economic activity (qualitative opinions on production or employment, housing permits, financial or monetary series, etc.), which signals cyclical movements in industrial production from six to nine months in advance; **Consumer Price Index:** Measures changes in average retail prices of a fixed basket of

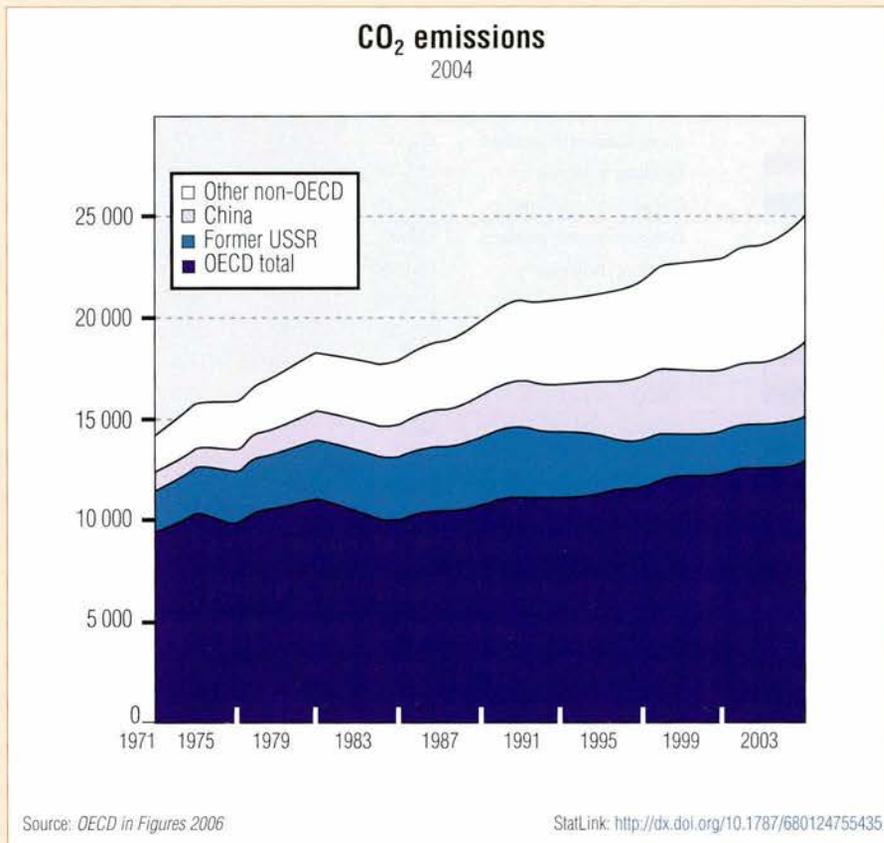
goods and services. **Current Balance:** Billion US\$; seasonally adjusted; **Unemployment Rate:** % of civilian labour force — standardised unemployment rate; national definitions for Iceland, Mexico and Turkey; seasonally adjusted apart from Turkey; **Interest Rate:** Three months. *refer to Euro area. ..=not available.

Source: *Main Economic Indicators*, December 2006.

Chinese warming

Although natural phenomena such as volcanic eruptions or warm ocean currents, or even the earth's tilt, might all contribute to global warming, carbon dioxide (CO₂) generated by human activity—from running homes and factories to flying planes and mowing lawns—is accepted as a major culprit. Measurements show the concentration of CO₂ in the atmosphere has risen nearly 20% over the past 45 years. Despite local cold spells, five of the hottest years on record have all occurred in the past seven years, according to the World Meteorological Organization. Meanwhile, most of the CO₂ emissions come from the OECD area, with 12,794 million tonnes in 2003. However, emissions from the rest of the world are rising. As the latest *OECD in Figures* shows, since 1985 China's level has more than doubled, with a rise of 2,009 million tonnes, not far short of the rise of 2,369 Mt for the entire OECD area. ■

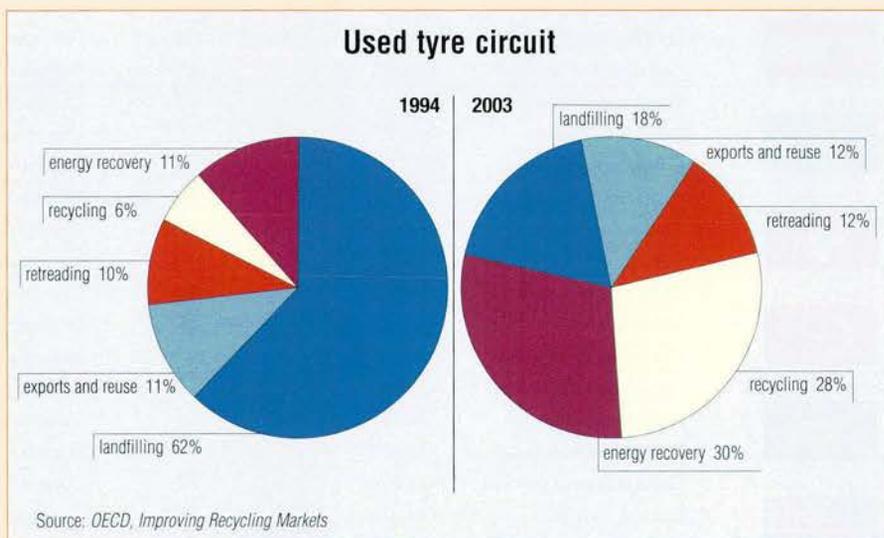
OECD Science, Technology and Industry Outlook 2006, ISBN 926402848X



Not so tired

A decade ago, used tyres ended up mostly in stockpiles, as an eyesore for landfill. Some 62% of old tyres went that way in 1994. Today, more are recycled for use in adhesives, insulation, brake linings, and conveyor belts, for instance. Their rubber is also used to pad out children's play areas. There are now other routes old tyres can take to get back into the economic circuit: retreading and regrooving; reuse for export; and incineration for energy.

In the last decade, because of their high calorific value—a tonne of tyres is equivalent to a tonne of good quality coal or to 0.7 tonnes of fuel oil—used tyres can act as a supplement fuel in pulp and paper mills, industrial boilers, cement kilns and power plants. Depending on the technology used, tyres can represent up to 25% of the total fuel of cement kilns. And tyres-to-energy power plants have been



built in Europe and the US. The market for tyre-derived fuel in the US has exceeded 150 million units for a decade now. Tyre recycling for civil engineering applications grew from half a million tyres in 1990 to 30 million in 2000. For instance, a worn-out tyre may be used in

asphalt paving and road construction, which increases pavement life by four to five times. Europe has seen a similar trend. Old rubber tyres have energy left in them after all. ■

OECD (2006), *Improving Recycling Markets*, Paris. See www.oecdbookshop.org

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USD 1.58 billion
Project Financing

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Best Project Finance

Nam Theun 2
USD 1.58 billion
Project Financing

Best Deal in India

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acquisition of NatSteel Ltd
SGD 486 million



Best Project Finance Deal

Nam Theun 2
USD 1.58 billion
Project Financing

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Sohar Aluminium
USD 2.5 billion
Project Financing

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EMEA - Power Deal of the Year

Shuaibah IWPP
USD 2.5 billion
Project Financing



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RasGas II & III
USD 970 million
Long-term Debt Facility

EMEA Petrochemicals Deal of the Year

Qatofin - Q-Chem II
USD 760 million and
USD 1.19 billion
Long-term Debt Facilities

EMEA IWPP Deal of the Year

Shuaibah IWPP
USD 2.5 billion
Project Financing

PROJECT FINANCE DEALS OF THE YEAR 2005

Asia-Pacific Power Deal of the Year

Nam Theun 2
USD 1.58 billion
Project Financing

Asia-Pacific Petrochemicals Deal of the Year

Titan Chemicals
USD 700 million
Refinancing



Best Deal of 2005

Nam Theun 2
USD 1.58 billion
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