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Distinguished Ministers, distinguished delegates, ladies and gentlemen, it is an honour for me to address you this evening, and I wish to begin by thanking Minister Haarder and the Danish government for this opportunity.

In my view, the focus of this conference - energy security and climate change is most relevant. Not only are these two issues *independently* very important for this region and beyond. They also can and must be addressed *together*. And let me add that in seeking to respond to both of them, we must also tackle a third challenge – namely adequate investment in the energy sector in the medium to longer term.

I appreciate that taking a longer term view of our energy future may be difficult at present, given the global and financial crisis. Current conditions may prompt us to look only to the near term and to focus on our own national circumstances. We may be seeing weaker demand now and lower prices, particularly in the oil

market. But the medium to longer term picture clearly indicates continued energy demand growth alongside supply side challenges, together with the compelling need to address climate change. And so we must not lose sight of these longer term goals. At the WEF in Davos recently, I noticed a clear contrast of views between the financial and energy sectors. The energy sector is much more optimistic while the financial sector is totally pessimistic. This view was reinforced when I was at the CERA week conference in Houston just last week.

Thus, to keep this optimism – and to properly address energy security and climate change – we must maintain our focus on investment. This is both government's and industry's responsibility. We must view the financial crisis as an opportunity more than a challenge in moving toward a cleaner, more secure energy future. We can do this by ensuring that sound energy investment strategies are at the heart of every economic stimulus package. And the IEA is calling this the 'clean energy new deal'.

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Let me begin with a comment on the oil market. Clearly, much has changed since July last year. In the oil market, prices are 70%

lower, largely due to a financial crisis that has spiralled into a full-scale economic downturn, affecting all areas of the world. With downward revisions in economic growth expectations, global oil demand in 2009 is now expected to average 84.7 mb/d, compared to our initial projection of over 87.7 mb/d made last July. OECD regions are leading this drop in demand, with a decline of 1.5 mb/d in 2009. In contrast, non-OECD growth remains positive – for now, at around 0.5mb/d for 2009. Meanwhile, by way of comparison, we see that a slowdown in gas demand is just becoming visible – at least in OECD Europe.

But while that may be the outlook for 2009, the medium term looks different, with a steady recovery in demand expected from 2010 or beyond. Though growth through 2013 will be lower compared to the prior decade, it will nonetheless average 1.0mb/d per annum.

And while the OECD leads the decline in demand, it is the non-OECD regions that will lead the medium term demand growth: 80% of the medium term growth will come from the Asia-Pacific region and from the Middle East. This will be driven not only by what is expected to be strong economic performance, but also by

the continuation of subsidy regimes. Our *World Energy Outlook 2008* (WEO-2008) calculations indicate energy-related consumption subsidies in 20 non-OECD countries amounted to $310 billion in 2007.

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All this suggests that if the current economic and financial crisis derails supply side investment, and the economy picks up again in another year or two, we could face a serious supply crunch. We have already seen in recent years that supply side risks have largely been above ground. These include: unplanned stoppages - such as last year's hurricanes and outages affecting Azerbaijan, worsening access to reserves, ageing infrastructure, and bottlenecks in labour, raw materials and construction capacity.

While it is too early to be definitive about the impact of the economic and financial crisis on the oil market, initial analysis by the IEA suggests a scaling back of our 2009 forecast by 1.0 mb/d due to project slippage. Assuming that this shortfall could multiply in the years beyond 2009 suggests that such project slippage could have a significant impact on expected spare capacity in 2013. While projected weaker demand in 2009-10 means that we are expecting to see spare capacity creep up to

around 3.5 mb/d in 2013 [1 mb/d last Jul], this figure does not fully reflect the impact of lower prices or the credit squeeze. It also assumes that OPEC does not slip further on key capacity expansions. As such, it is possible that spare capacity could be lower than the current projection suggests. Even if not, the longer term trend remains unchanged – this current 'pause for breath' must not allow us to deter our focus on investment for our longer term energy security.

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Moving beyond the medium term, our need to continue considering energy security and investment is just as great as we look to the longer term. Our "reference" or "business as usual" scenario in the WEO 2008 shows that growth in global primary demand for oil (excluding biofuels) will rise by 1% per year on average to 2030, rising from 85 million barrels per day in 2007 to 106 mb/d in 2030. [10 million b/d lower than WEO-07.]

All of the projected increase in world oil demand comes from non-OECD countries: over four-fifths of this increase comes from China, India & Middle East. The Middle East, in particular, will become a consumption centre.

[CLICK TO SHOW RED ON GRAPH] OECD oil demand will fall slightly, due mostly to declining non-transport oil demand. And the non-OECD demand share of oil will surpass that of OECD countries in around 2015.

But while overall OECD oil demand may fall, we must bear in mind that *oil import dependency* in some regions – including in the EU and particularly in Asia – will increase to 2030. Given the increasing interconnectedness of markets, this could have significant knock-on effects for other regions in times of crisis – again highlighting the need cooperation in addressing energy security.

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But this challenge does not only relate to demand growth. In fact, this graph highlights that the gross additions needed to offset decline in production levels to 2030 will far exceed the net additions needed to meet demand growth. Just to keep the current level of production, gross additions of 45 mb/d, or four times (the current production of) Saudi Arabia will be required. [6 times to meet production decline + demand.] By 2030, two-thirds of world production will come from new fields awaiting development today or yet to be found. So not only demand

growth, but decline in production at existing fields will be a key driver of investment needs moving forward.

Additionally, we must bear in mind that the business as usual scenario suggests that OPEC's share of global oil output will rise from 44% in 2007 to 51% in 2030. This represents a further challenge in terms of security of supply as we move forward.

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We should also note at this juncture that global demand growth in the medium to longer term will not simply be limited to oil. In the 'business as usual' scenario, world primary energy demand will grow by 45% from 2006 to 2030; with an average annual growth rate of 1.6% [1.8% WEO-07]. Coal will play a growing role, becoming the second most important energy source after oil. Again, if we are to meet this demand in a stable and secure fashion, we must have more investment.

So let's take a look at the cumulative investment in energy supply needed to meet growing energy demand. Huge inflows of capital are needed to meet demand and replace existing and future supply facilities that will be retired. In fact, cumulative investment in energy supply infrastructure amounts to $26.3

trillion (in year-2007 dollars) from 2007 to 2030. [$4.4 trillion more than WEO-07 due to upward revision of unit costs.] Oil & gas account for nearly half of this, with power generation accounting for the other half.

63% of the total will be needed in non-OECD countries – clearly highlighting that the investment challenge is a global issue and at the very heart of addressing energy security.

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Focusing in on energy security, let me make a comment on the IEA's system of strategic petroleum reserves. You likely know IEA member countries are required to hold 90 days net imports of oil. These stocks – available to be pledged to the market in times of emergencies – are a very visible and reassuring part of emergency preparedness in IEA countries. And indeed beyond: the IEA encourages other countries to follow suit, and is now working with non-Member countries, such as China, India and Thailand, to develop their own SPRs.

This 90 day requirement means that if <u>all</u> imports came to a halt, we could survive for 3 months. [CLICK] Drawing only on public stocks (cf industry stocks), which now stand at 1.5 billion barrels,

IEA Members could respond to a supply disruption like Hurricane Katrina, where 2 mb/d were brought to the market, for 24 months. [CLICK] A bigger disruption of 4 mb/d – like Iraq's invasion of Kuwait and about the size of the current production of Iran – could be dealt with for one year. Without adequate investment, we may see a supply crunch in the mid term. In such a tight oil market, together with higher dependence on OPEC, these IEA emergency response measures continue to be important. In this regard, I would say that the current level of SPR provides a comfortable cushion.

So for oil supply disruptions IEA countries are very well prepared. This is less true for disruptions of gas supply, such as the recent situation between Russia and the Ukraine demonstrated. We and our member countries consider this something that should be further addressed, as I appreciate do the countries of the Baltic region, given the considerable gas dependence of some countries here. The IEA is now looking into emergency policies for natural gas. Gas stocks can be a comfortable cushion to compensate for disruptions. But such stocks are expensive - more expensive than oil stocks in fact. So we are also exploring a range of other options, such as source

switching and drawing on the SPR in times of gas crisis. These measures will be considered by IEA Ministers at our next Ministerial meeting in October this year. Here in the Baltics, I appreciate that you are considering a range of options, such as gas storage, a liquid gas terminal and course additional pipeline infrastructure. In this regard, let me add that physical connections and integrated grids, *as well as* sound market mechanisms for the speedy movement of supplies as demand and supply change, are essential.

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Having outlined these highly important emergency response measures in the field of oil, it is at the same time important to note that our very notion of "energy security" is broadening. Since the first and second oil crises, we have been successfully seeking to improve our oil security. But we must also now consider gas security much more seriously as we increasingly turn to gas as a cleaner source of energy. Similarly, we must take account of the reliability of renewable energy sources and nuclear power, as well as the stability electricity markets. What we also see is the increasing energy interdependence between different regions. Rising energy demand (and energy import dependency) in one

region can have knock-on effects for another in a supply crisis, as already mentioned.

So what do we need for better energy security? First, we can make a considerable and cost-effective impact on our own energy security by seeking to curb demand through encouraging energy efficiency. Second, in addition to solid emergency response measures – which the IEA firmly advocates for, we need diversity of supply. By this, I mean diversity in terms of the types of energy relied upon, the sources from which they are derived, and the routes and means by which they are transmitted and distributed. Integrated networks are an important part of this, especially for smaller economies. In this regard, the IEA supports continued efforts for a European energy market that is open, transparent and competitive. Similarly, regionally coordinated electricity grids and gas markets can enhance energy security, as can the integrated use of renewable energy.

And for all of this, we need greater transnational cooperation – both regional and international, as well as between consumers and producers. It is not appropriate – nor indeed any longer effective – to seek to maximise one country's energy security at the

expense of another. And finally, we of course need more investment as I have already outlined.

With regard to all of these, the IEA very much appreciates the efforts being undertaken here in the Baltics, including through BASREC itself. The extension of electricity grids, the establishment of a joint electricity market in Latvia, Estonia and Lithuania, and enhanced measures to foster renewables and encourage energy efficiency through the proposed Baltic Interconnection Plan would all provide excellent means of addressing energy security, and we would encourage speedy conclusions on these issues. We similarly appreciate recent efforts to enhance security of gas supply, as I have already mentioned.

With that, I will turn to climate change, but let me note here that all of the criteria for energy security that you see here on the slide can also be valuable in addressing climate change. In this regard, we must view efforts to address climate change as an opportunity to enhance our energy security and to foster more sustainable economic growth.

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The problem of climate change is inextricably linked to our energy production and use. In the WEO-200 reference scenario, global CO2 emissions from energy will jump by 45% between 2006 and 2030 to 40.6 gigatonnes (growth rate of 1.6% pa). An increasing share of these emissions will come from non-OECD countries. Coal in non-OECD countries - for example - is the single biggest contributor to CO2 emissions and its share will increase considerably over time. This is unsurprising given its abundant and secure supply for many such countries.

This trajectory of a 45% growth in emissions puts the world on track for a global temperature increase of around 6 degrees. This is clearly unsustainable; economically, socially and environmentally. As such energy investment decisions taken <u>now</u> must address these concerns – decisions that lock-in existing conventional technologies now will shut the door to substantially reducing CO2 emissions in the future. We cannot afford to miss this opportunity.

This again highlights our growing global interconnectedness in the energy arena, and the need for enhanced cooperation. We see an

example of this here in the Baltic region – which represents countries with diverse energy profiles. Some are predominantly fossil fuel consumers, others largely producers; some have a long history of efforts in the fields of energy efficiency and renewables, others are relatively new to this domain – you can all stand to gain from working more closely together.

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In light of this grave CO2 challenge, our WEO-2008 set out two energy policy scenarios to take the world to a lower emissions pathway of 450 ppm and 550 ppm of CO2 in the atmosphere. I note here that the EU's 20-20-20 target, as well as US President Obama's campaign proposal of an 80% cut in greenhouse gas emissions by 2050, appear consistent with the 450 ppm scenario.

This graph shows the trajectories for energy-related CO2 emissions to 2030 in the different scenarios, assuming 3.3% global GDP growth to 2030. It shows that we must reduce emissions from a projected 40.6 Gt in 2030 (in RS) – to reach 33 Gt in the 550 ppm scenario and to 26 Gt in the 450 ppm scenario.

This will require a transformation or 'revolution' of the energy sector. In particular, measures in three areas are vital:

- Energy efficiency: 54% in the 450ppm scenario.
- CCS (particularly in the 450 ppm scenario after 2020). This is particularly so in China, as well as in all countries with a heavy reliance on coal.
- Change to the energy mix through the use of RE and nuclear power – we are concerned investment in these may well be affected by the financial crisis as much or more than conventional oil will be. One of the biggest problems we sometimes face, particularly with nuclear is the NIMBY syndrome. I appreciate that some within your region – including Poland and Sweden – are now seeking to reassess the role that nuclear power should play within their energy mix.

I note that you will discuss energy efficiency, including CHP, and renewables as one of your key themes tomorrow and I applaud this – efforts in these areas provide vital and often highly cost-effective means of diversifying supply, reducing demand *and* addressing energy-related CO2 emissions. We know that many countries now have strong targets for renewables and energy efficiency – what we need to see now is <u>action to fully implement</u> and realise such targets. I would add in this regard that enhanced

integration within this region need not only be about gas supplies – but increased energy trade through renewables, such as via offshore wind networks or the development of biofuels, could aid also both energy security and climate change goals.

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But the widespread deployment of low-carbon technologies, both existing and new will require yet more investment. I mentioned before that in a business as usual scenario, investment of $26.3 trillion is needed in energy infrastructure just to meet growing demand and production decline. Well, in our two low emissions scenarios, significant additional investment is needed in power plants and in more efficient energy-related capital stock. For example, the 450 Policy Scenario requires further power plant investments of $3.6 trillion and efficiency investments of 5.7 trillion over 2010 to 2030, in addition to that in the reference scenario. In total, these additional investments amount to 0.55% of world GDP on average per year. We have a huge business opportunity here, and yet, in the current economic climate, there is a real danger that we will miss the opportunity to move toward a cleaner energy future. However, in the IEA's view, the incorporation of sound energy infrastructure measures into economic stimulus packages – what the IEA is calling the 'Clean

Energy New Deal' – provides an opportunity to both encourage economic growth in the short term and to address the long term sustainability of the energy sector.

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Let me note here that these two parts of the investment equation – traditional supply side investment and support for low carbon technologies – are not incompatible. Rather, *both* are needed. This is shown clearly WEO-2008: even in the lowest carbon scenario of 450 ppm, oil demand in 2030 will still be slightly higher than in 2007 – reaching 94.6 mb/d in 2020 and then declining to just under 90 mb/d in 2030. And OPEC production may increase by another 12 mb/d – from 36 mb/d in 2007 to 48 mb/d in 2030. So the industry need not be alarmed that it does not have a future. Having said that, our analysis of the 450 scenario when extended to 2050 (in *Energy Technology Perspectives* 2008) suggests total global demand will stand at 60 mb/d in 2050. This clearly highlights the 'opportunity' that addressing climate change can represent, in that such measures can also contribute significantly to oil security.

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In concluding, ladies and gentlemen, let me emphasise that if we are to address the key challenges of energy security and climate

change, we take a more global and longer term view of the energy sector. We must broaden our concept of energy security; we must seek to enhance regional and international cooperation through concrete measures not just political statements; and we must at the same time work to implement actions domestically – from enhancing emergency response measures right through to better implementing energy efficiency and renewable energy targets.

But we must also address a third and related challenge – that being continued and appropriate investment. For investment, I mean:

- we have to ensure adequate investment on the supply side to meet growing demand and production decline in the medium to long term; and
- we have to ensure adequate investment on both the supply and demand sides to encourage a sustainable energy future for all – in terms of addressing climate change.

Of course, the current global financial problems are nothing short of critical and will make this investment challenge all the more

difficult. It is already clear that investment in energy-supply infrastructure is being affected in three main ways by the financial and economic crisis:

Firstly, energy companies are finding it much harder than in the past to obtain credit for both ongoing operations and to raise fresh capital for new projects, because of tighter credit markets.

Secondly, falling demand for energy caused by the economic slowdown has reduced the need for suppliers to invest in new capacity; and

Finally, the slump in energy prices resulting from weak demand has made new investments generally less profitable.

As I have outlined, these will all have important implications for energy security and may also have an environmental impact:

Energy Security: In the near term at least, weaker demand than previously expected is likely to result in an increase in spare or reserve production capacity. But there is a danger that

investment in the coming months and years is reduced too much, leading to a shortage of capacity and another spike in prices several years later when the economy is on the road to recovery.

Environment: In the near term, slower economic growth will undoubtedly curb the growth in emissions. But in the longer term, lower fossil-energy prices and financing difficulties could result in lower investment in clean energy technologies, increasing the need for fossil-fuelled capacity and putting the world onto a higher emissions trajectory than might otherwise have been the case. There are good reasons to believe that this may indeed prove to be the case: renewable and nuclear energy projects are generally much more capital intensive, they are less able to compete in a low energy price environment, they have longer lead times and they are subject to greater technology and market risk.

As such, governments and the energy sector – across the globe – must maintain a focus on the medium to longer term picture, and therefore on the need for both cooperation and investment. We must view the financial crisis as an opportunity - more than a challenge - to move toward a cleaner, more secure energy future.

This can be done by ensuring that sound energy investment strategies are at the heart of every economic stimulus package, as well as through greater global dialogue and cooperative efforts. We have been making recommendations on this for some months now, and we are calling it the "clean energy new deal". The recent proposal by the European Commission to provide for Eur 5 billion in energy and internet infrastructure as part of the EU recovery plan is one such example. Of particular note for this region, the proposal includes 500 million euros to fund gas and electrical interconnection infrastructure in this region. And the very fact of your being here today indicates your desire to co-operate in this important field.

Let me close by noting that the IEA stands ready and willing to draw on our wealth of expertise, data and strong networks with the public and private sectors, to assist both IEA Member and non-Member countries alike in addressing these vital issues in the months and years to come.

Our next MTOMR, due for release in the middle of this year, will assess impacts of the financial and economic crisis on the oil sector. And our Office of the Chief Economist (responsible for

the WEO) will release a preliminary study of the impacts of the crisis on the energy sector in time for the G8 Energy Ministerial meeting in May.

Additionally, let me know that in this, the (intended) final year for negotiating a post-Kyoto climate change framework, the IEA will continue to play its role. The Agency has contributed to negotiations by providing facts-based analysis, including by highlighting how energy security and climate change can be addressed together. We will build on this work in the *WEO-2009*, due for release in November, which will include a focus on gas supply, climate change mitigation cost scenarios and energy sector investment.

Let me also express at this juncture my sincere respect for Mr. Rasmussen, Prime Minister of Denmark, and his Ministers and government, for their work to coordinate international efforts to address this most challenging global dilemma.

Ladies and gentlemen, I wish you very fruitful discussions tomorrow on these most important of topics. **Thank you.**