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**LOW CARBON RUSSIA:
PERSPECTIVES AFTER
CRISIS**

**Second Annual Researchers Meeting
International Research Network for Low-Carbon Societies (LCS-RNet)
Berlin 2010, September 20-21**

SINCE 1990, RUSSIA HAS BEEN A GLOBAL LEADER IN THE SCALE OF GHG EMISSION REDUCTIONS

According to the latest Russian GHG inventory, in 2008 the total Russian GHG emissions were 33% below 1990 level!

In 2009, Russian energy-related GHG emission is expected to stay 39% below the 1990 level!

In 1991-2007, Russia:

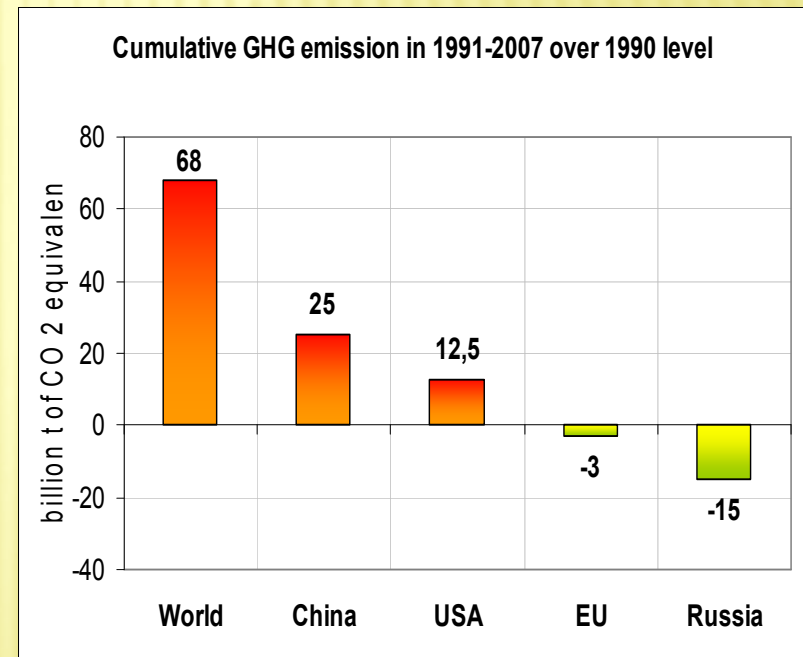
more than compensated excess cumulative GHG emissions (over the 1990 level) by the USA, or

by 2/3 compensated excess cumulative GHG emissions (over the 1990 level) by China, or

by 22% compensated excess global cumulative GHG emissions (over the 1990 level)

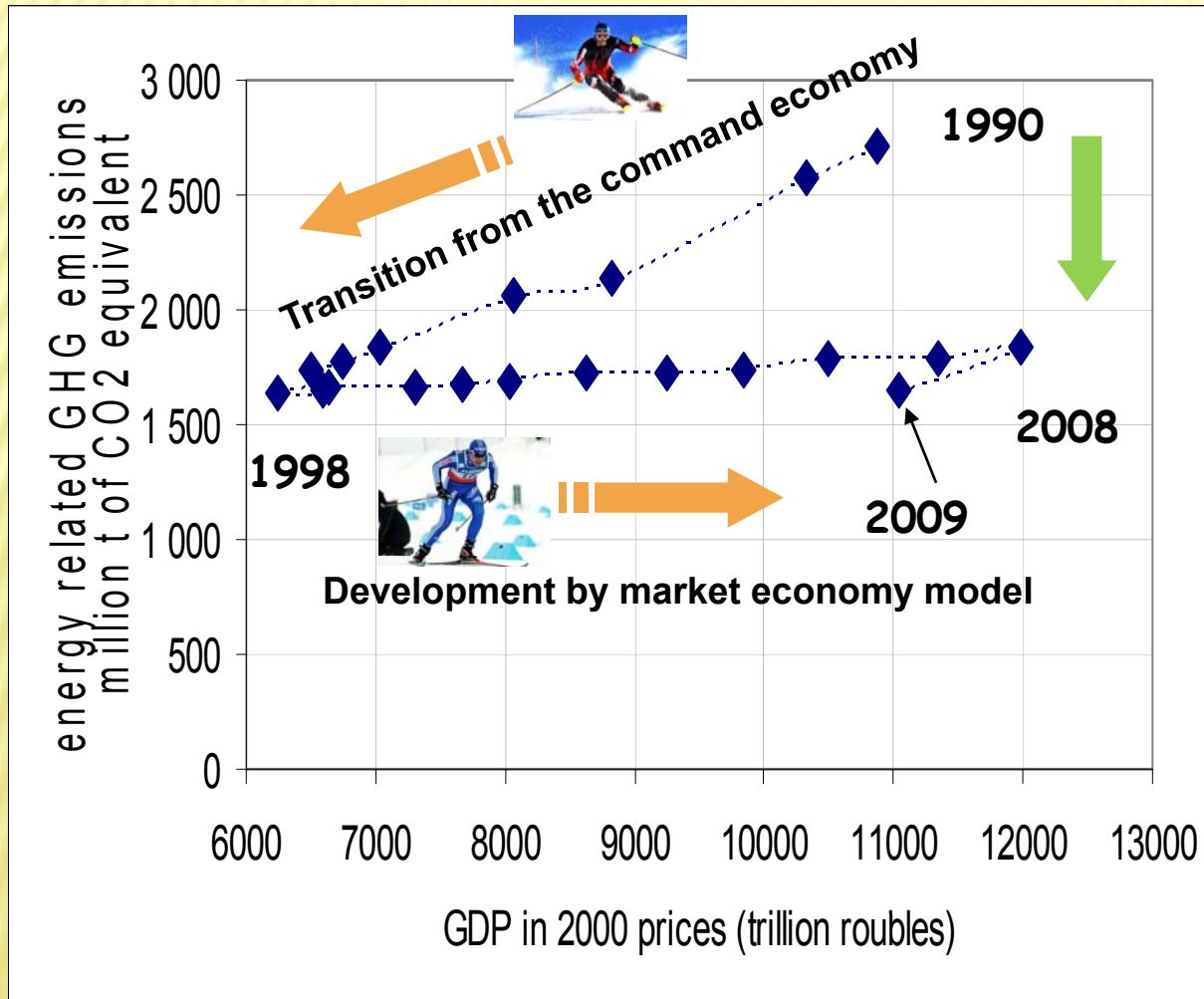
Russia has paid a high price for its emission reduction in the 90's. This is not "hot air". This reduction was accompanied by a loss in the economic growth of at least 1,000 \$/ton CO₂ emission reduction (in the mid-90's prices)

It seems not wise, but many other nations failed to do it otherwise.



The "frameworking" policies in Russia appeared to be more effective in combating GHG emissions, than "special" measures in many other countries

SINCE 1998, RUSSIA HAS NEARLY DECOUPLED THE ECONOMIC GROWTH AND GHG EMISSIONS



Emission downhill in 1990–1998:

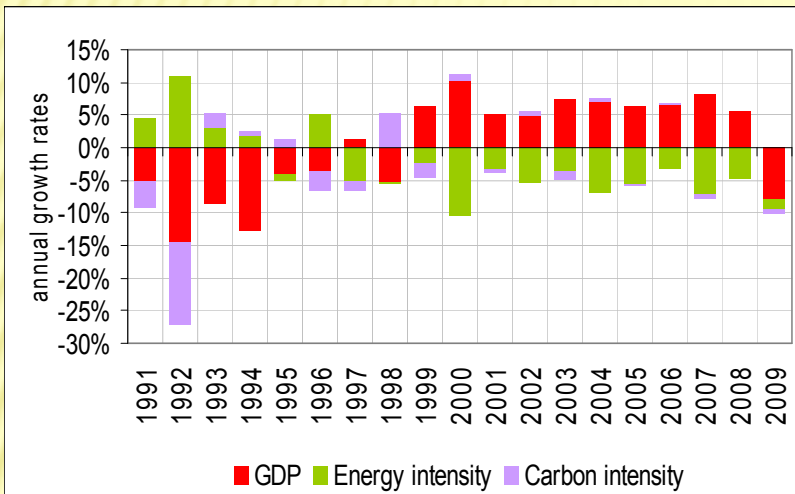
- the transition process was accompanied
 - by a switch to less militarized, less energy intense economy
 - by substantial GDP and GHG emissions reduction

Emission cross-country in 1998–2008:

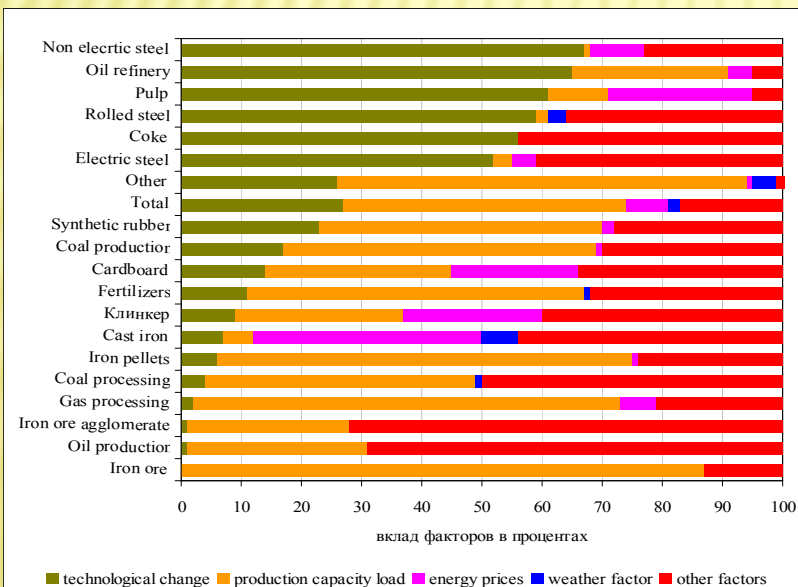
- Russia's economy revived based on a more effective market economy model
 - In 1998–2008, GDP doubled while GHG emission was only 12% above the 1998 level



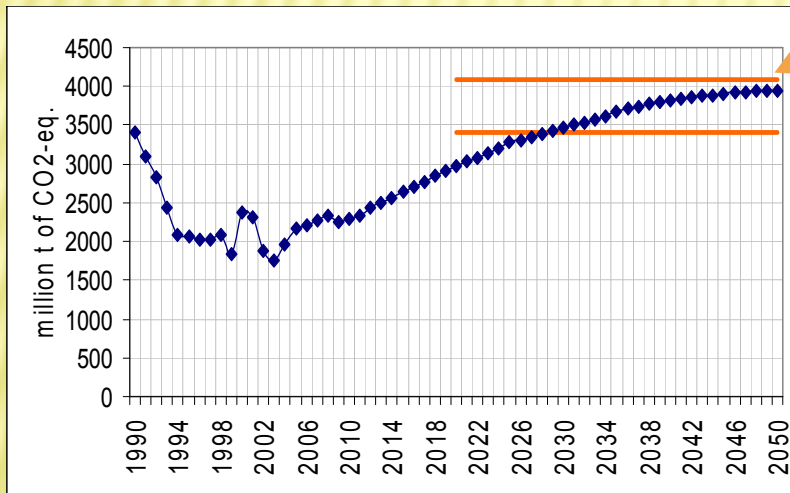
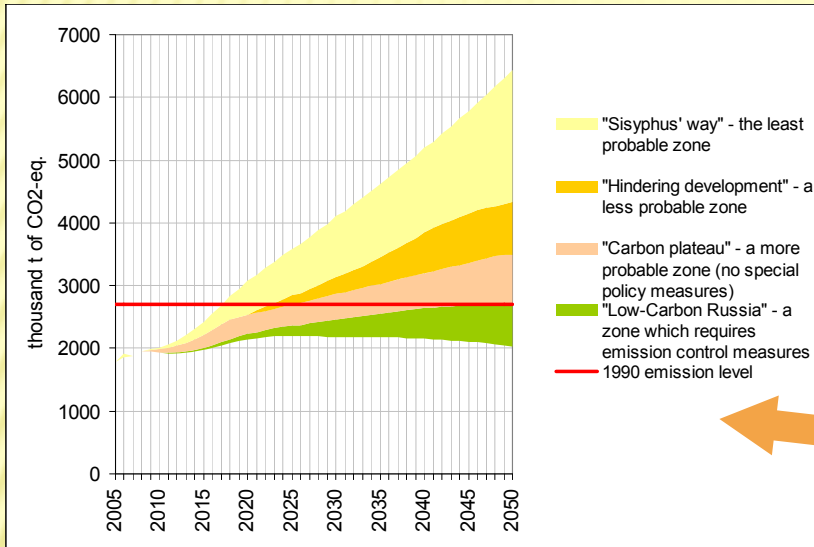
DECOUPLING WAS MOSTLY A RESULT OF DYNAMIC ENERGY INTENSITY REDUCTION, WHICH PRACTICALLY NEUTRALIZED GDP GROWTH CONTRIBUTION TO GHG EMISSIONS



- Russia became a world leader in terms of energy intensity reduction rate
- In 1998–2008, AAGR were:
 - for GDP +6,7%
 - for GDP energy intensity - 5,3%
- Dynamic reduction of GDP energy intensity was basically driven by structural changes
- In a market economy GDP energy intensity is at least twice as low as in a command economy of a similar climate and size
- Technological factor
 - was responsible only for slightly more than 1% of GDP energy intensity decline per year out of 5%
 - Its contribution was as high as in other nations
 - As a result, the technological gap with Western countries was not bridged
 - Despite of dynamic improvement in energy efficiency, Russia still stays in the list of the most energy intense countries in the world



RUSSIA LAGS MUCH BEHIND IN RESEARCH OF LOW CARBON FUTURES



- Only few Russian expert groups provide projections of GHG emission trajectories and investigate mitigation options and policies at a country-wide, regional and local levels
- Among country-wide research groups and studies:

CENef

- Low-Carbon Russia: 2050

Institute for Economic Projections of the Russian Academy of Science

- projections to 2030 extrapolated to 2050 - it sees no low-carbon Russia

Energy Research Institute of the Russian Academy of Science

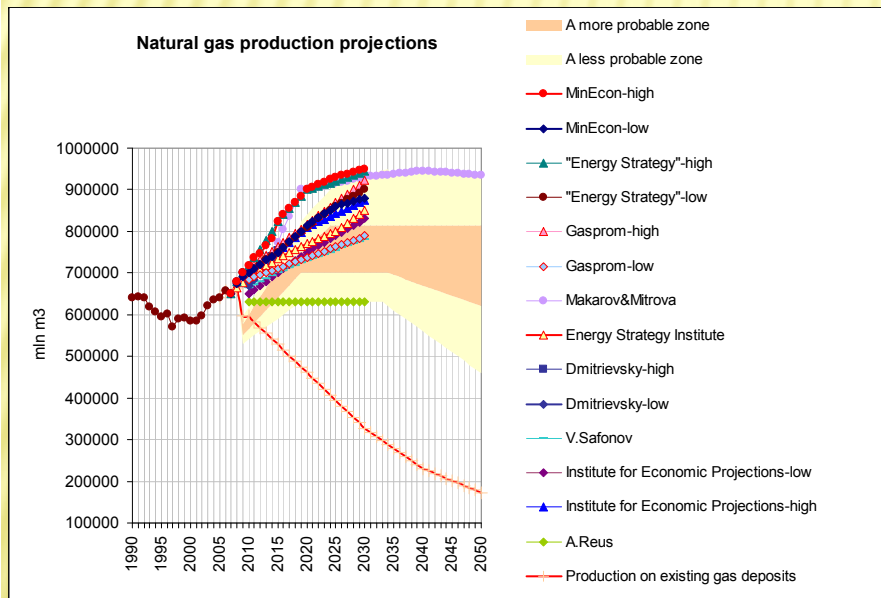
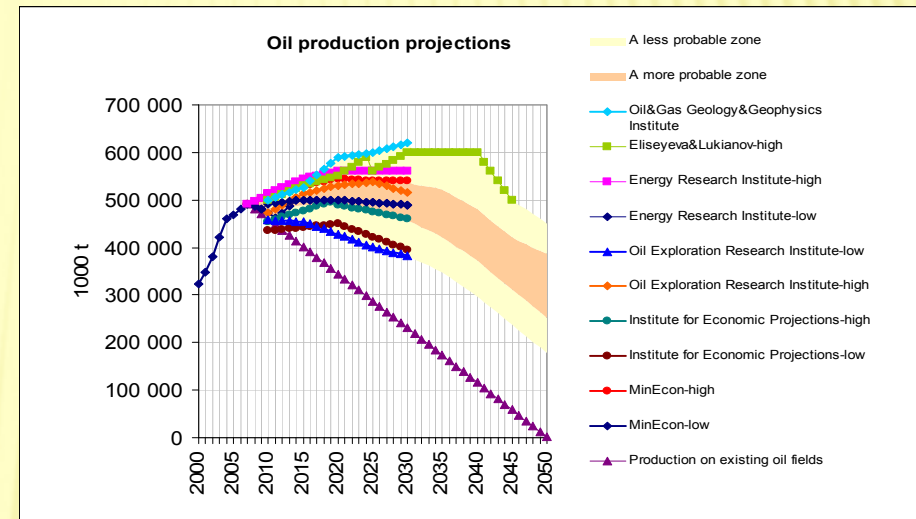
- projections to 2030 extrapolated to 2050 - transition to low-carbon Russia slows down economic growth

- Among regional studies:

- CENef – EU project “Promoting investments in energy efficiency in Russia’s regions”



ORIGINS OF THE FUTURE RUSSIAN GHG EMISSIONS UNCERTAINTY TO 2050

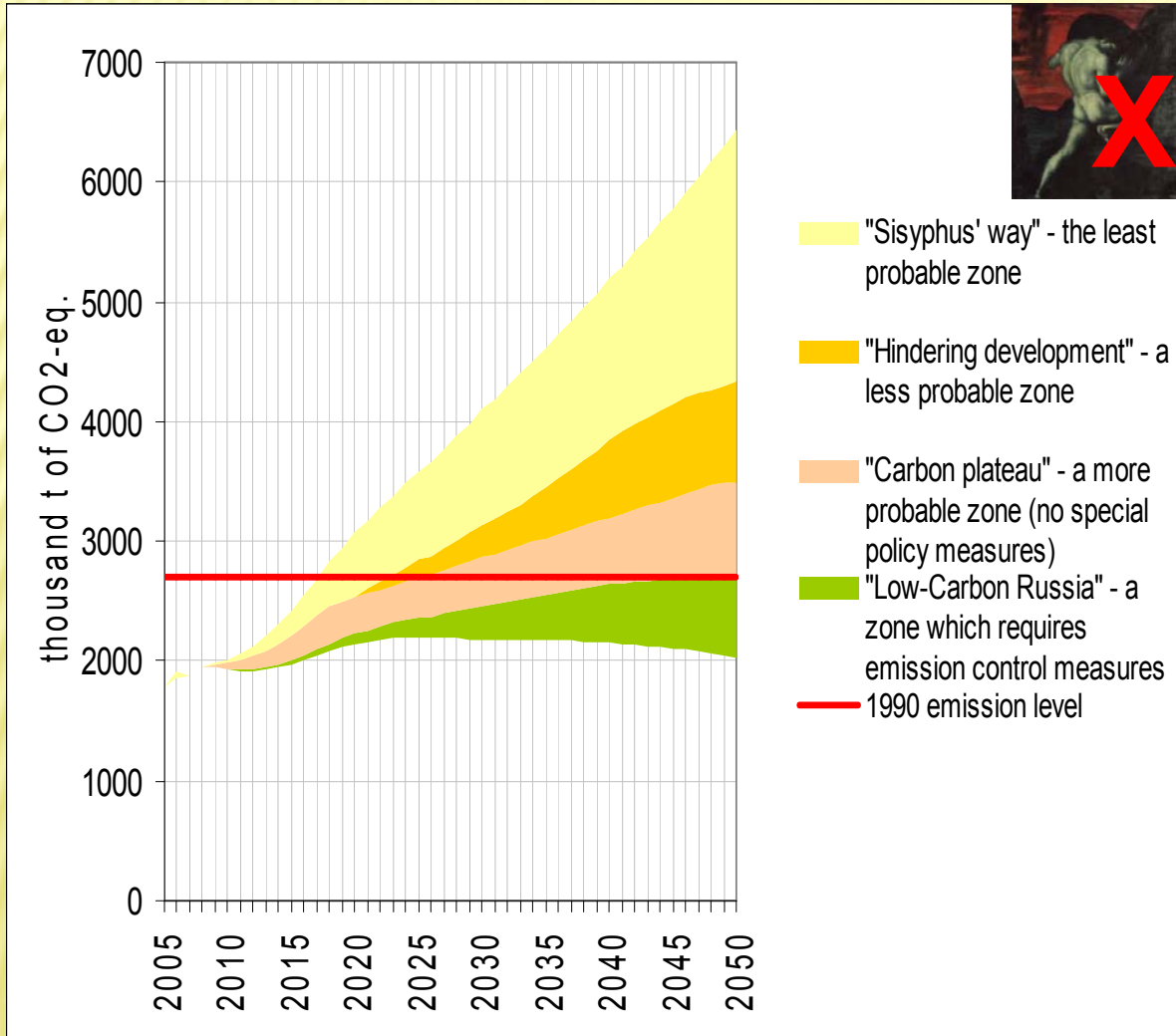


and:

- population size and structure
- technological change and effectiveness of policies to promote innovations and energy efficiency
- international and domestic energy prices
- structural changes in GDP and industrial output
- impact of climate change
- others



OF 4 SCENARIO FAMILIES, THE "SISYPHUS' WAY" DID NOT SURVIVE THE LATEST ECONOMIC CRISIS

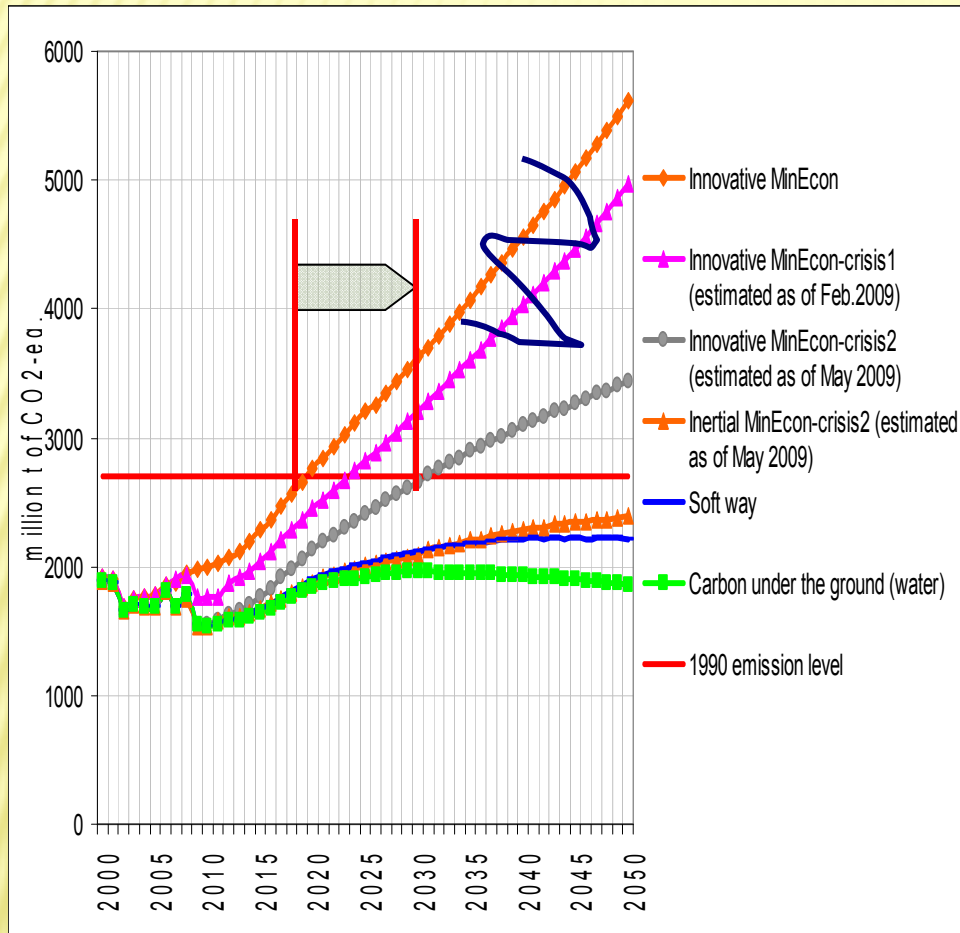


Judgments on the probability of each scenario family were based on the following criteria:

- **sufficiency of oil, gas, and coal resources and production bases**
- **energy prices dynamics and energy resources affordability to domestic consumers**
- **possible change of Russia's position in the global energy markets and corresponding sufficiency of export revenues to support economic growth**



RUSSIA'S FULFILLMENT OF ITS COMMITMENTS UNDER THE KYOTO PROTOCOL IN 2008-2012



- **Post-crisis scenarios delayed approaching the 1990 GHG emissions level by at least 10 years**
- **Russia is sure to comply with its Kyoto commitments**
- **In 2008-2012, accumulated by Russia emission permits for three greenhouse gases (CO₂, CH₄ and N₂O) from the energy sector alone may account to 5,000-5,500 million t of CO₂**
- **It is three times Russia's annual emission in 2012 and equals 20% of the global CO₂ emission in 2005**
- **Emission permits may serve an “air bag” for Russia in the post-Kyoto period**
- **Paragraph 13 of Article 3 of the Kyoto Protocol allows it to use unused emission permits to comply with the commitments in the next period (“banking”).**



TIMEFRAME FOR RUSSIA'S POSSIBLE COMMITMENTS AFTER 2012

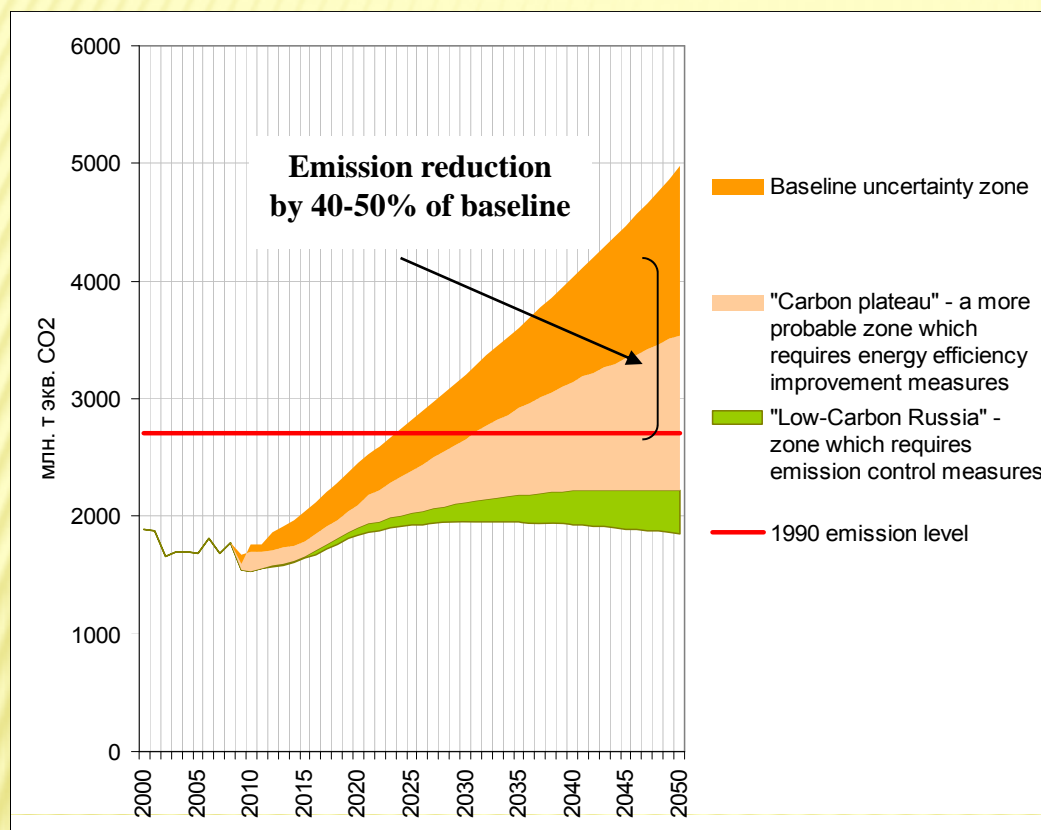
- ◆ **Commitments for Russia may be different from those of other countries: not to *reduce emission* by xx%, but to *keep emission* at the level of xx% below the 1990 value**
- ◆ **Even more precisely, Russia's post-Kyoto commitments may be formulated as follows:
keep average annual emission in 2013-2017 (2020) at the level xx% below the 1990 value, with an account of unused in 2008-2012 emission permits**

Year of approaching 1990 GHG emissions level

Post-Kyoto commitments	Without "air bag"	With "air bag"
Limit average annual emission with the 1990 level	2031	>2050
Keep average annual emission at 5% below the 1990 level	2028	>2050
Keep average annual emission at 10% below the 1990 level	2025	2047
Keep average annual emission at 15% below the 1990 level	2023	2041
Keep average annual emission at 20% below the 1990 level	2020	2037
Keep average annual emission at 25% below the 1990 level	2018	2033
Keep average annual emission at 30% below the 1990 level	2016	2030



INVESTIGATION OF POSSIBLE RUSSIA'S ENERGY-RELATED GHG EMISSION TRAJECTORIES BY 2050



- ▶ The set of models used does not contain all the necessary formalized feedbacks. This extends the uncertainty zone, as we progress into the future
- ▶ The “Carbon plateau” zone assumes full implementation of the technical energy efficiency potential by 2030 and then continued renovation of energy equipment and facilities based on technical innovations at the same pace until 2050
- ▶ “Low-Carbon Russia” includes a family of scenarios which assume, that special emission control measures will be taken
- ▶ In this zone, emission does not reach the 1990 level, and after getting onto a “plateau” starts to decline

Transition to the “Low-Carbon Russia” scenarios must be accomplished in 2020-2030 or sooner, otherwise energy shortage and costliness will hinder economic growth.

Those who believe that it may lead to slower GDP growth, are mistaken.

On the contrary, economic growth will be hindered, if this option is rejected.



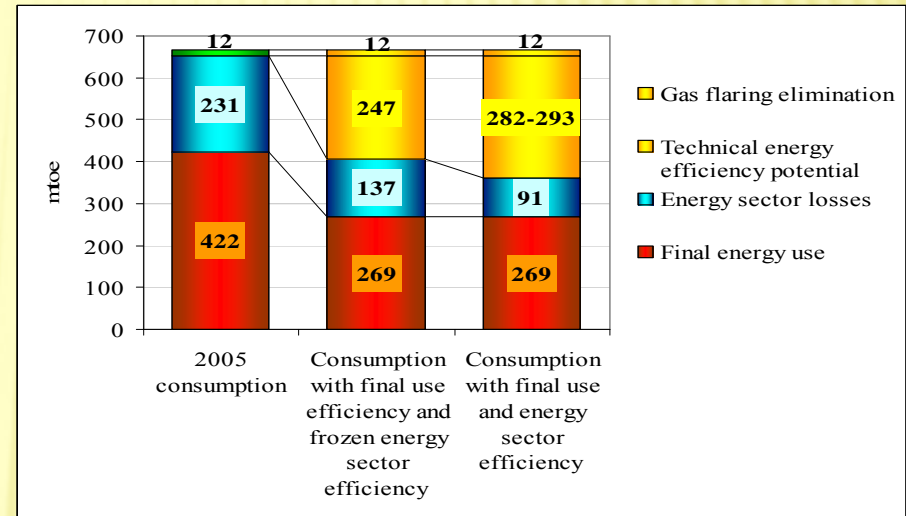
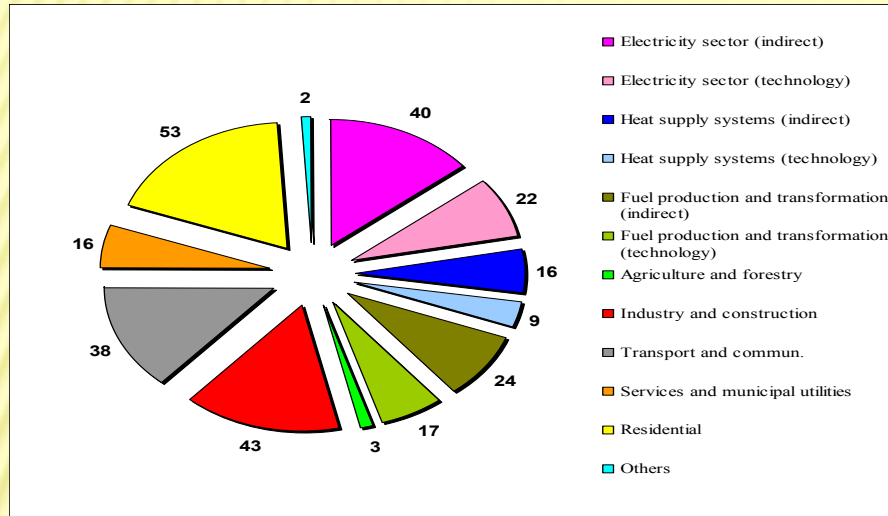
THE POSSIBILITIES TO CUT RUSSIA'S GHG EMISSIONS BY 50% NOT FROM THE BASELINE, BUT FROM THE 1990 LEVEL ARE YET POORLY INVESTIGATED

- × In 2050, Russia can reduce its GHG emissions from the energy sector by 40–50% compared to the “baseline” level
- × “Low-carbon” Russia:
 - + does not necessarily have an emission trajectory, where fast growth is followed by a “plateau” and then by a noticeable reduction
 - + may have a different emission trajectory: maximum possible hindering of emission growth until 2030 and keeping it at a level below 1990 until 2040 with further eventual emission reduction
 - + with the carbon price of 30–50 €/t of CO₂-eq. emission can be kept in 2050 at 75% of the 1990 level
 - + with carbon capture and storage technology, at 70% of the 1990 level
 - + Russia's commitment to keep its emission in 2050 at 20% below the 1990 level is equal to the EU's commitment to reduce its emission in 2050 by 23% of the 2006 level, U.S.' commitment to 33% reduction, Great Britain's commitment to 15% reduction, and Japan's commitment to 29% reduction
- × In this strategy, Russia's “air bag” increases by 2050 to 30–37 billion t of CO₂-eq. and becomes a global “air bag”, because this value is equal to 111–140% of global CO₂ emission in 2005;
- × Cumulative emissions of three greenhouse gases in 2008–2050 for “low carbon” Russia are 40–45% below the “baseline” level

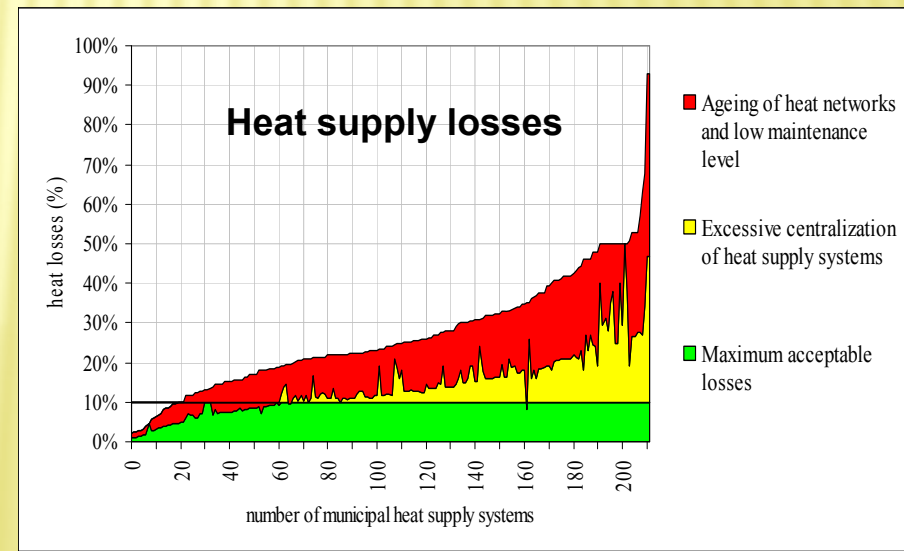
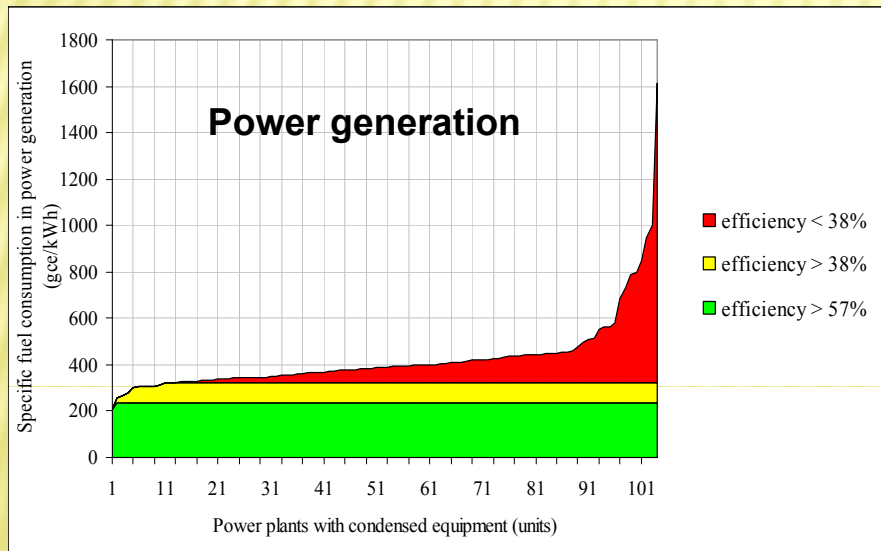


LIKE PREVIOUSLY, ENERGY EFFICIENCY WILL DRIVE FURTHER GHG EMISSION REDUCTIONS IN RUSSIA

Russia's energy efficiency potential



Russia's energy inefficiency "red hills"



RUSSIAN POLICIES ALLOWING TO MITIGATE GHG EMISSIONS

- × Implementation of the modernization policy for the whole economy
- × Reduction of GDP energy intensity by 40% in 2007-2020
 - + Presidential decree on energy efficiency (2008)
 - + Law on energy efficiency (2009)
 - + Federal energy efficiency program (2010)
 - + All regions and municipalities have adopted energy efficiency programs (2010)
- × Growth of renewable (except large hydro) contribution to power generation up to 4,5% in 2020 (promoting policies are still weak)
- × Approval of the first 15 joint implementation projects with total GHG emission reduction of 40 million t of CO₂ equivalent (2010)
- × Adoption of the Russian Federation climate doctrine
- × Hot summer of 2010 made it visible for the Russians that Russia would not be among the few nations enjoying climate change, like many had hoped before
- × The hot summer of 2010 may change the attitude of the Russian authorities and of the public to the necessity of implementing more aggressive climate change mitigation and adaptation policies

