The Multi-Regional Pilot Project to Develop Monitoring and Reporting Capacity for Greenhouse Gases in Russia

CENEf - Russian Center for Energy Efficiency

PNNL - Pacific Northwest Nat'l Lab (US)

WWF - World Wide Fund for Nature Russian Programme Office

Regional Inventory Initiative

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COP-6 Side Event on Inventories in EIT
The Hague
November 2000

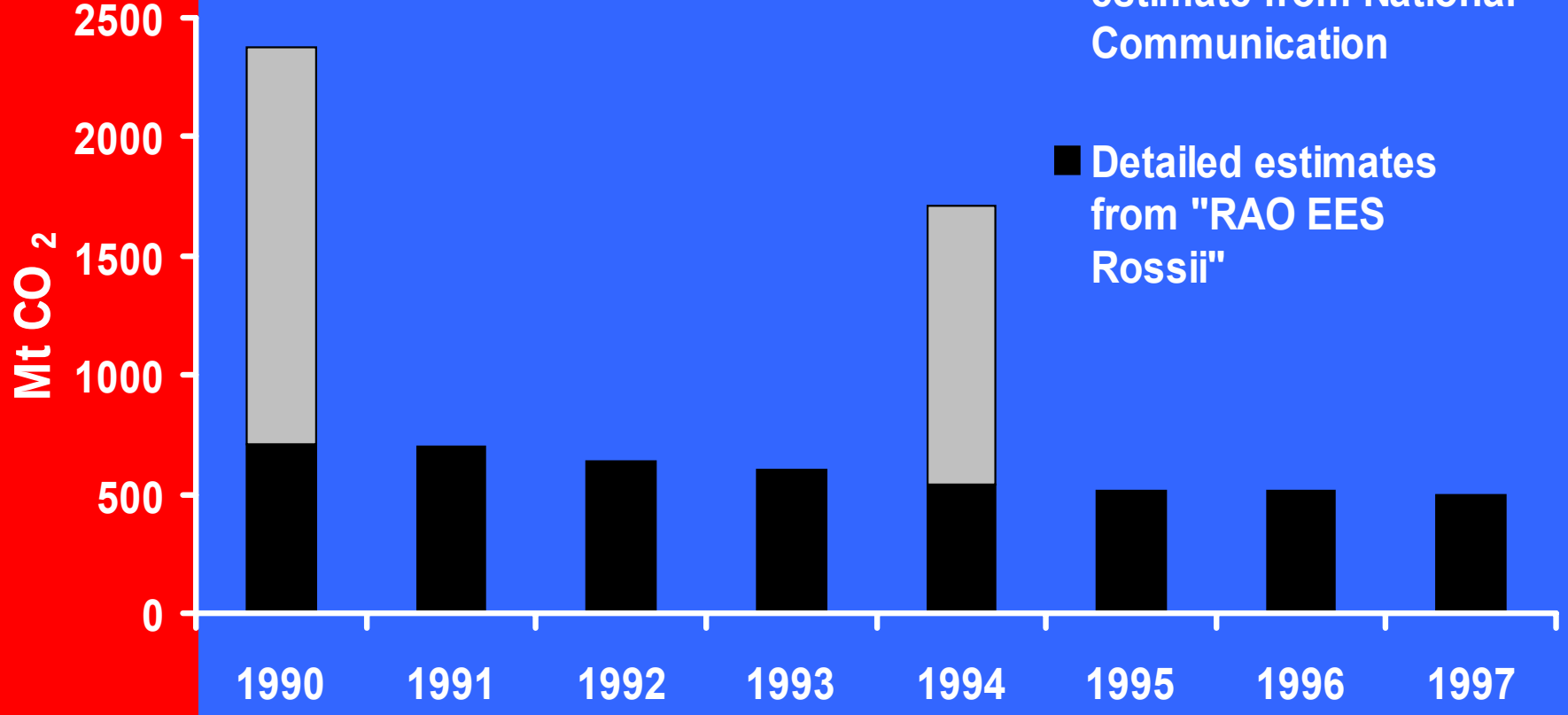
Goal

- Create a bottom-up national inventory system in Russia that meets international standards of accuracy, completeness and transparency through high quality data collection and analysis

Current Status of Inventories in Russia

- National: very approximate estimates in First and Second National Communications, some estimates for 1995-1996
- Sectoral: Only about 1/3 of all GHG emissions (or 1/4 of CO2) well-documented through inventories. Power sector well documented because of RAO EES Rossii's inventory.

Current Status



First Phase of Inventory Project

1999

- Conducted first regional inventory in Novgorod Region
- Adapted IPCC Methodology to conditions in a Russian region
- Assessed institutional capabilities of regions to prepare sustainable, cost-effective GHG inventory practices
- Studied gases with high global warming potential (HFCs, PFCs and SF6) for first time in Russia

Reasons for regional approach

- Bottom-up regional inventories help to build capabilities, links and methodologies necessary for national system
- Weak national inventory system and institutional problems at federal level, alongside growing role of regions
- Need to solve methodological problems of bottom-up inventories
- Need to develop sustainable, low-cost approach to monitoring

Second Phase

2000

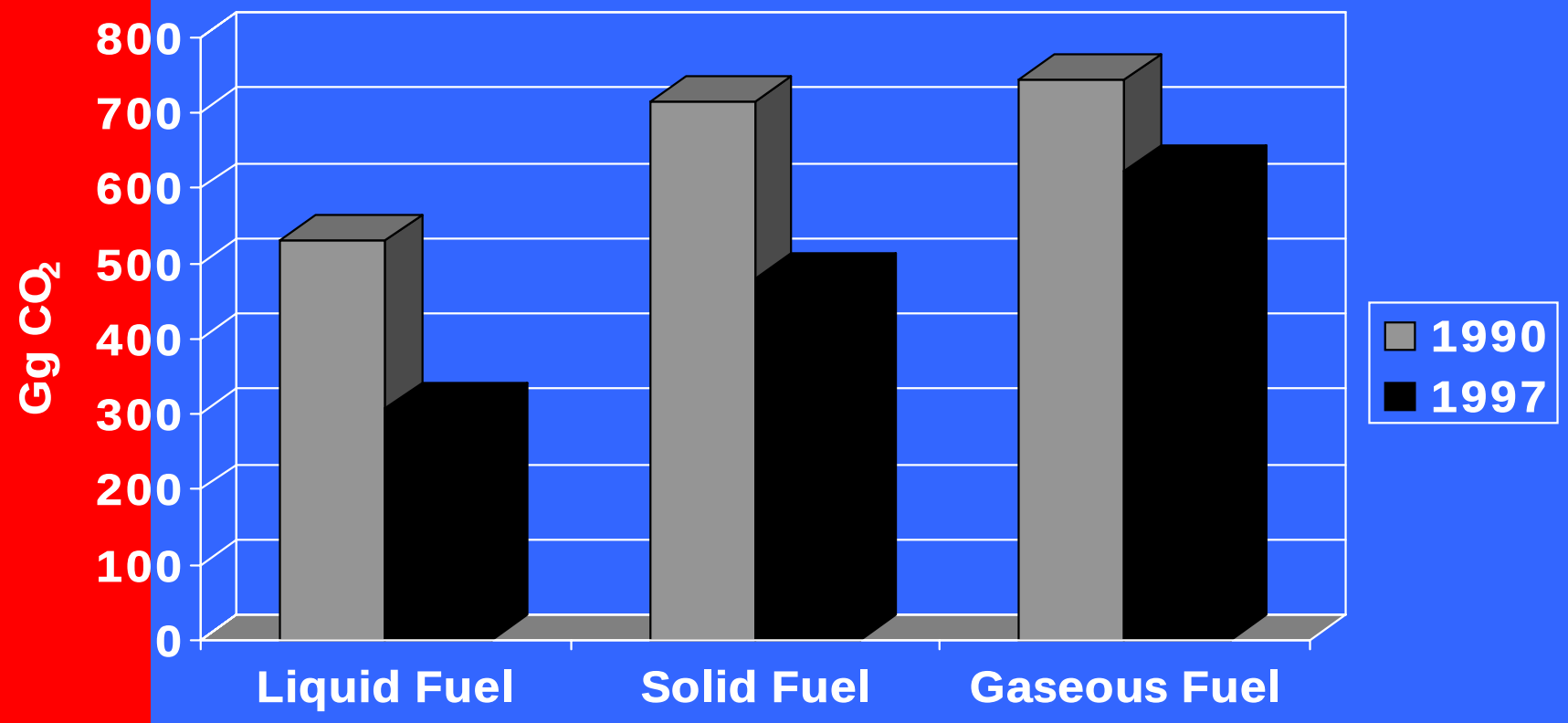
- Selected four regions with diverse economies for inventories
- Overviewed sectoral and regional contributions to national GHG emissions
- Prepared detailed energy balances to support GHG inventory in 2 pilot regions
- Created solid institutional basis for the national inventory
- Workshop in Chelyabinsk, 5-6 Dec. 2000

Possible Next Steps

2001

- Develop greater institutional capacity
- Prepare sectoral inventories
- Work with more regions
- Cover larger share of key sources
- Prepare national inventory guidelines for government approval
- Implement IPCC “Good practice”, including uncertainty analysis

National energy related CO_2 emissions, 1990 vs. 1997



Energy accounts for 76% of total GHG emissions

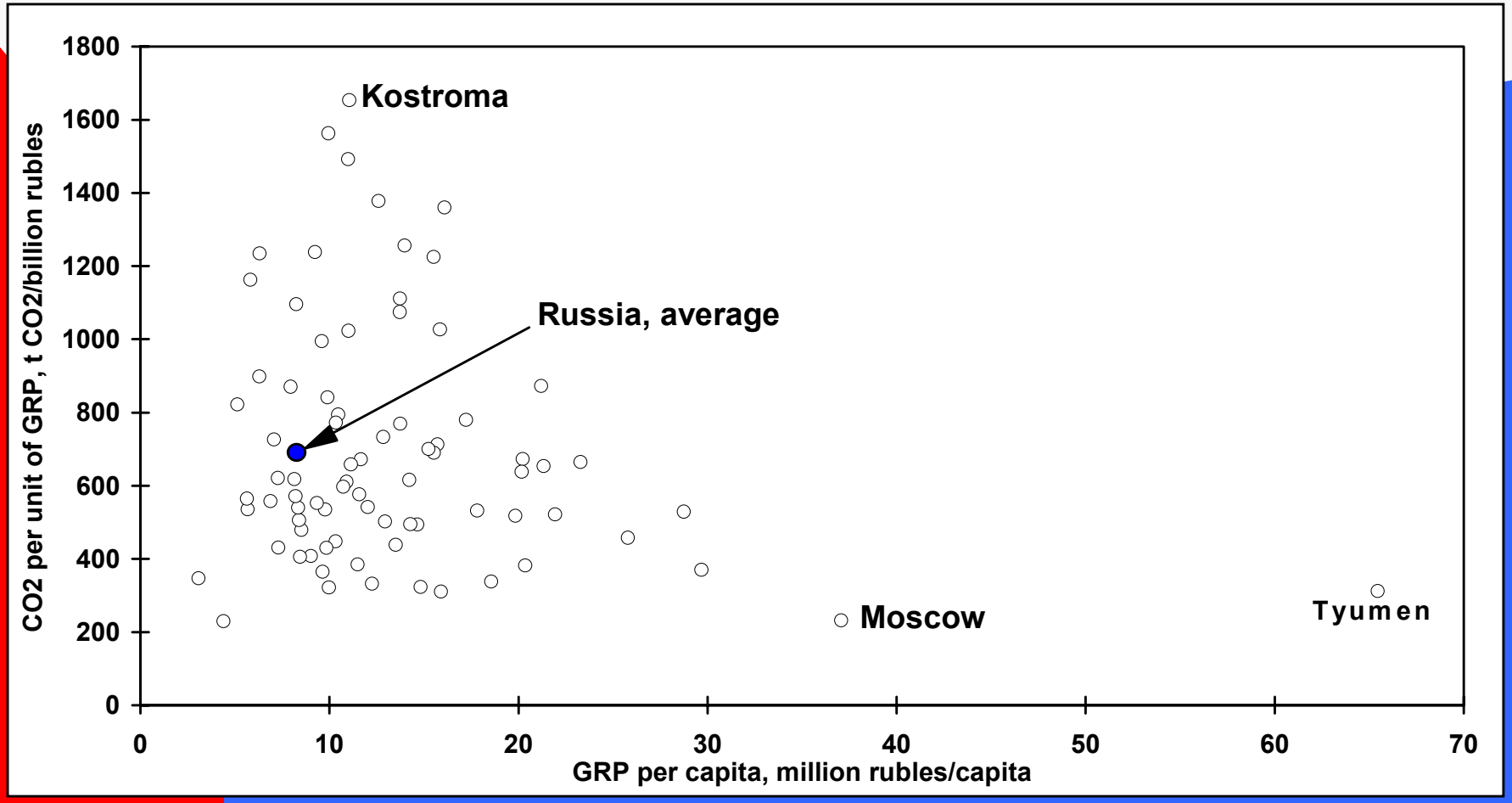
Regional analysis of national CO_2 emissions, 1997

Of Russia's 80 regions:

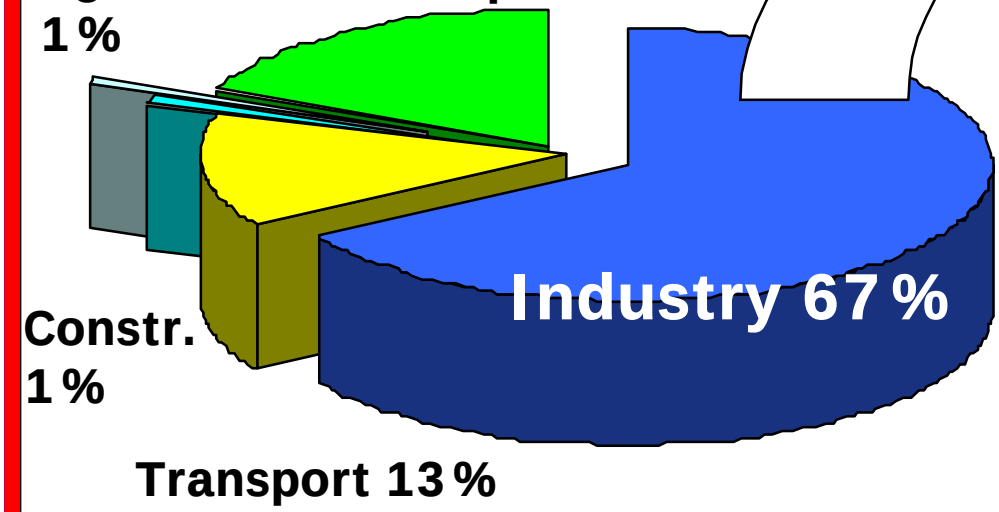
15 top regions	**> 50 % of total CO2 emissions**
32 bottom regions	**< 10 % of total CO2 emissions**
7 top regions	**> 50 % of emissions from coal combustion**
10 top regions	**> 50 % of emissions from gas combustion**

Regional analysis of national CO_2 emissions, continued

The higher gross regional product (GRP) per capita, the lower CO_2 emission per unit of GRP



Estimate of sectoral contribution to the total CO_2 emission (1996)



Subdivision non-compatible with IPCC

Power & heat	73 %
Metallurgy	15 %
Fuel & refinery	4 %
Chemicals	2 %
Construction materials	2 %
Machinery & metals	2 %
Food & drinks	1 %
Wood & paper	1 %

Regional inventories

- **Small but instructive cross-section of the country**
- **Diverse geographic and economic parts of Russia**

Results of regional inventory

- Novgorod
- Sakhalin
- Chelyabinsk
- Khakasia

GHG emissions

- Energy
- Industry
- Agriculture
- Land Use Change & Forestry (LUCF)
- Waste

- *Brief overview*
- *Specific features*
- *Conclusions and recommendations*

Novgorod - overview (1998)

Total emissions (Gg)

- CO_2: 3942
- CH_4: 33.04
- N_20: 5.57
- HFCs: 0.00014
- PFCs, SF: ~0
- LUCF: -5293

CO_2
Energy - 3855
Industry - 89

CH_4
Energy –7.9
Agr. – 11.4
Waste – 13.4

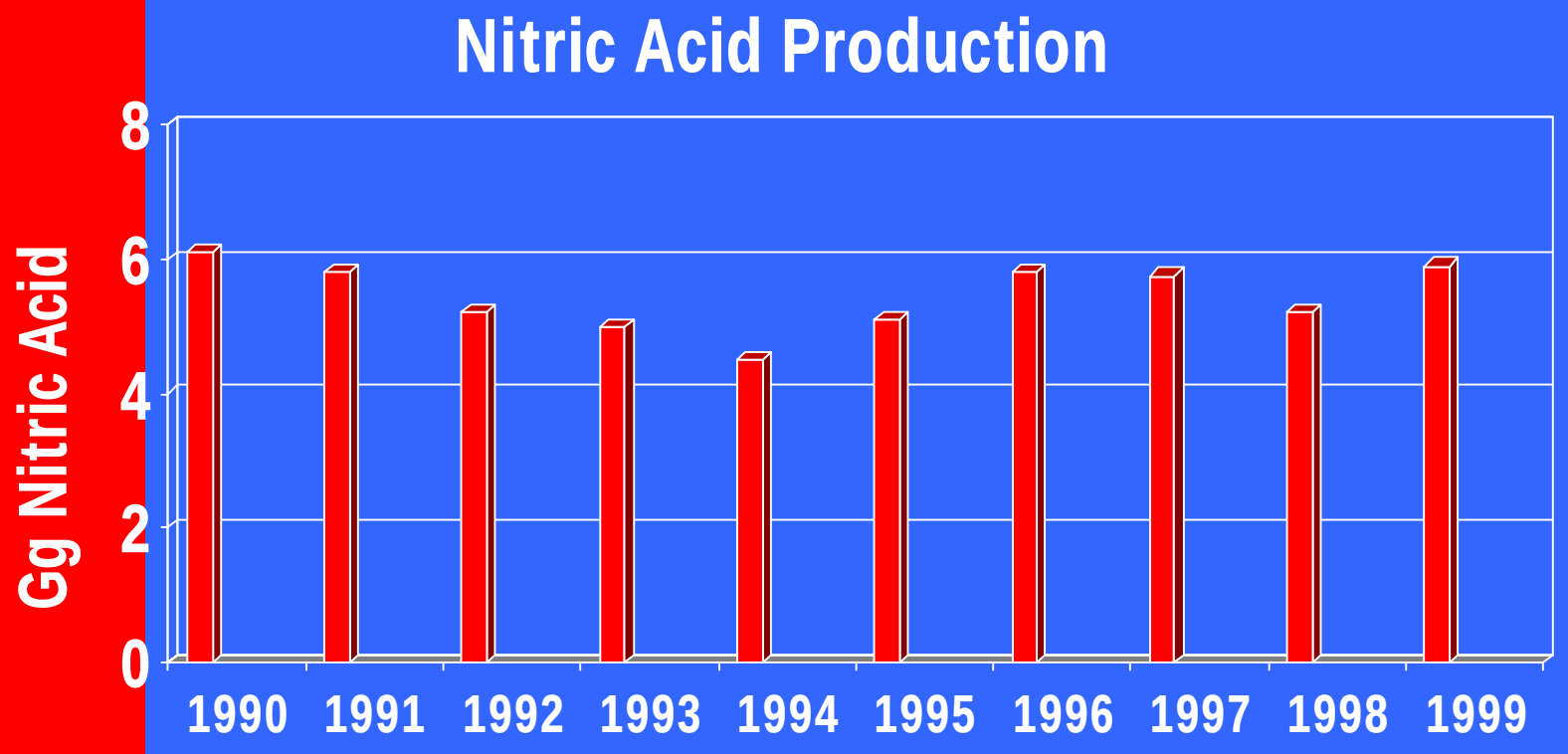
N_2O
Ind. – 5.27
Agr. – 0.2

Novgorod - full details energy

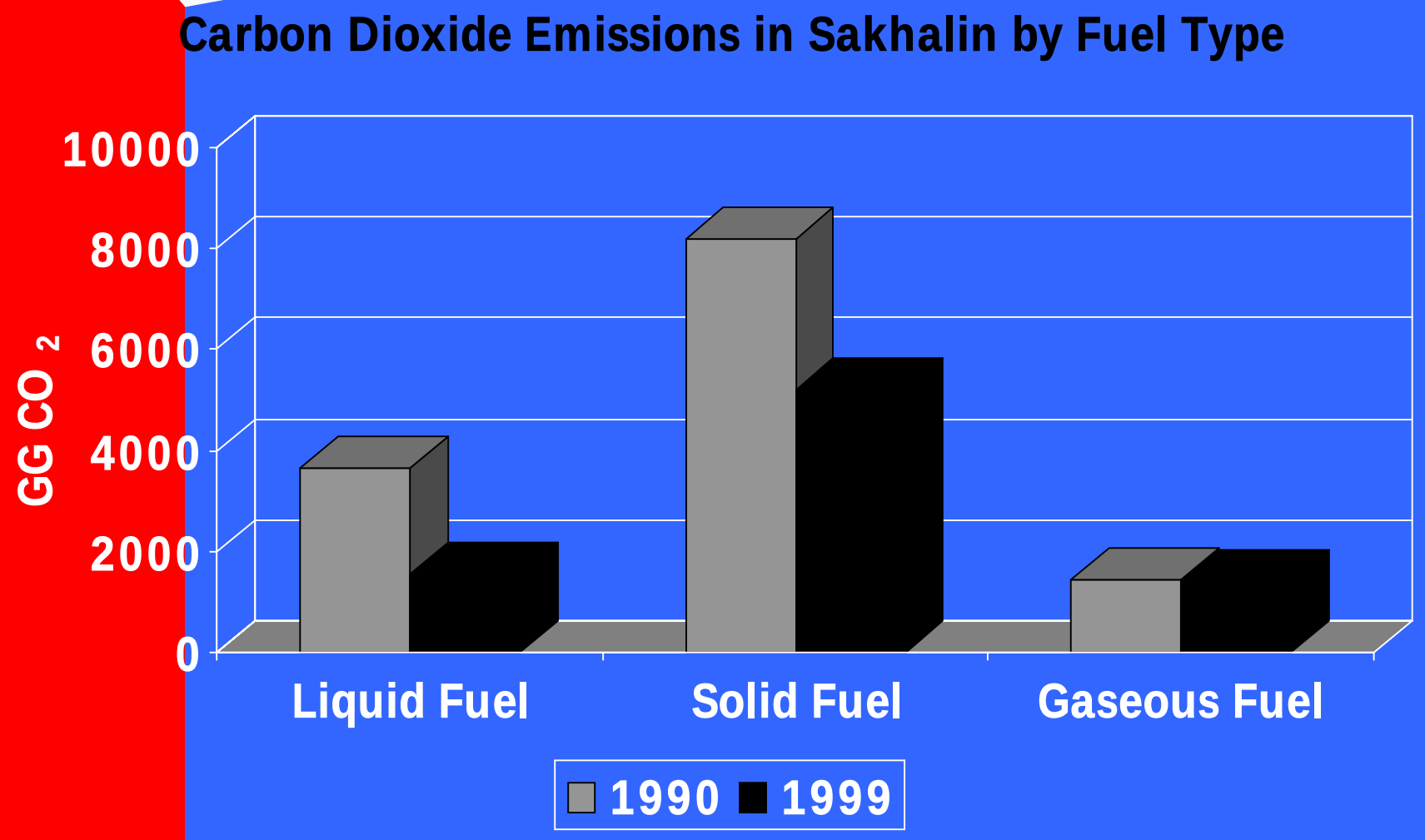
Source category		1990	1994	1995	1996	1997	1998	1999	1999 %
Large thermal power and heat stations		1112	952	827	839	693	693	699	19%
Production of power and heat by non-energy enterprises		606	495	522	542	507	508	559	15%
Gg CO2/yr. Transport	Domestic aviation	32	3	1	1	1	1	1	~0%
	Road	654	680	680	681	650	682	550	15%
	National navigation	133	60	50	42	44	47	60	2%
Residential sector	Small heat stations	78	223	253	219	284	279	196	5%
	Private residential sector	1850	1956	1789	1494	1655	1544	1623	44%
Total by specified sources		4465	4369	4122	3818	3834	3754	3688	99%
Total by non-specified sources		655	334	202	132	74	103	28	1%
Total by Reference approach		5120	4703	4324	3950	3908	3857	3716	100%

Novgorod - lesson for all

Changes in market situation directly influence GHG emissions. Variations can be especially fast where installed production capacity is significantly larger than actual production now

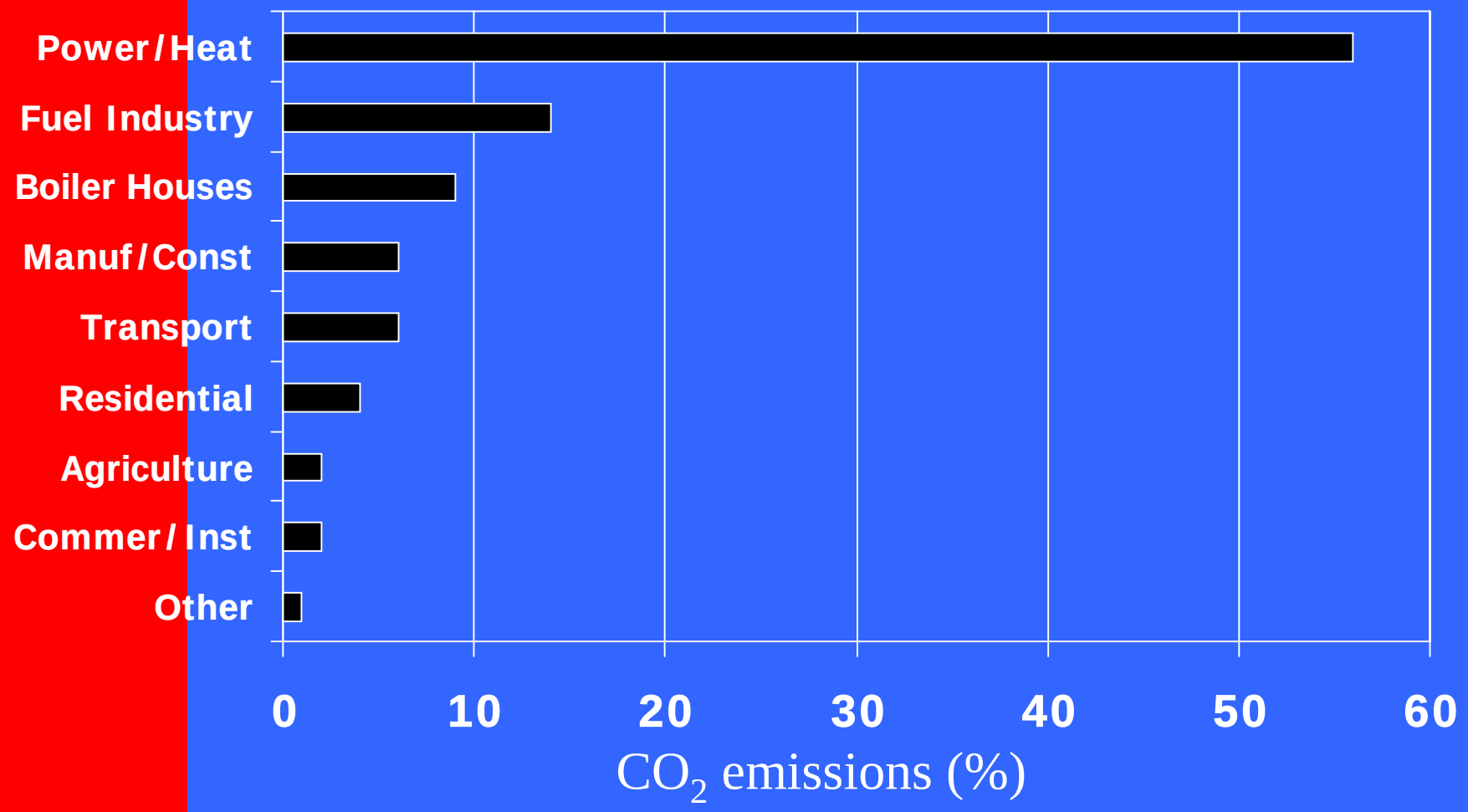


Sakhalin - energy

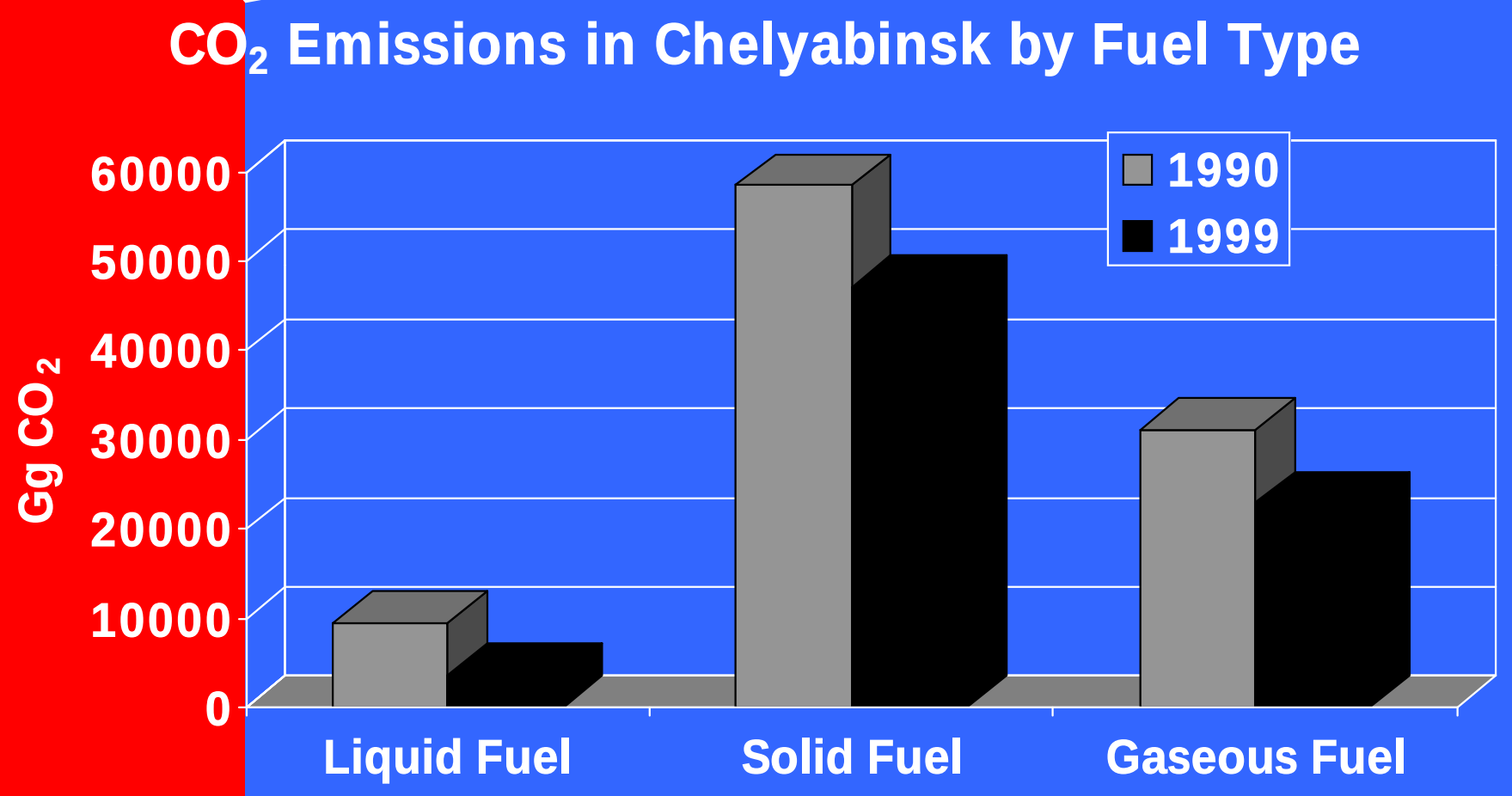


Sakhalin - energy

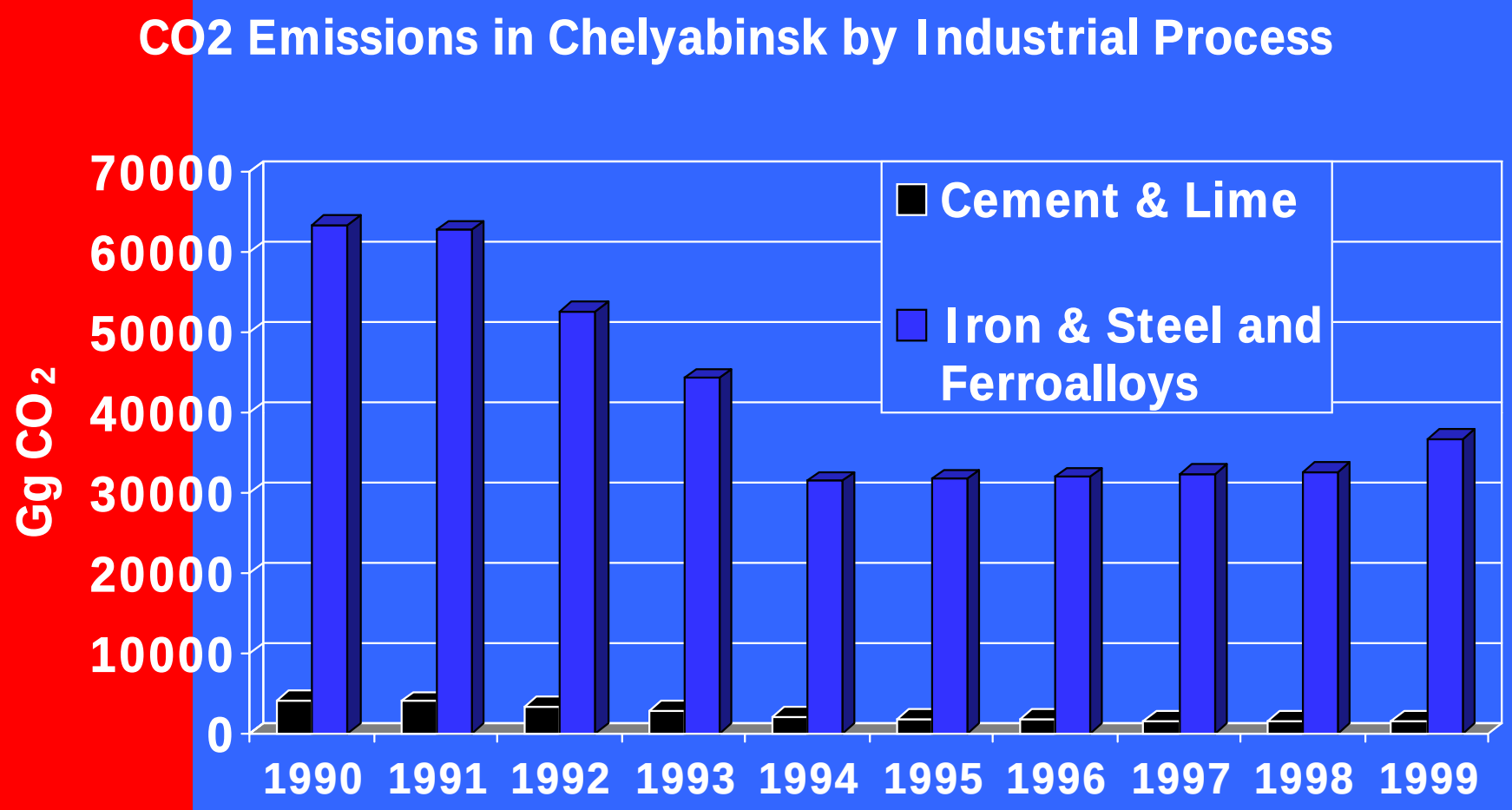
CO_2 Emissions in Sakhalin by Sector (1999)



Chelyabinsk- energy



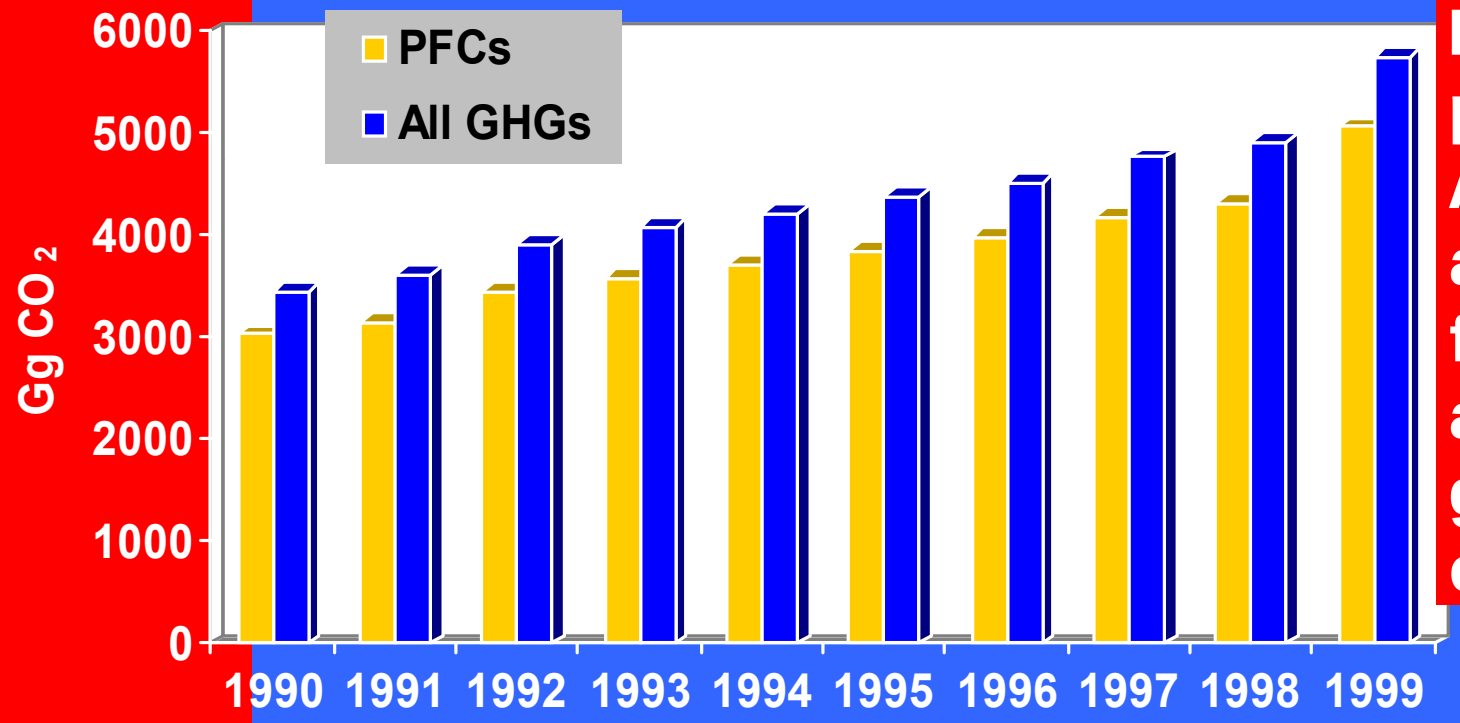
Chelyabinsk- industry



Khakasia - lesson for all

Aluminium production

- In some economically vibrant enterprises GHG emissions are already higher than in 1990
- Healthy companies depend heavily on international trade (potential effect of international “GHG leakage”)

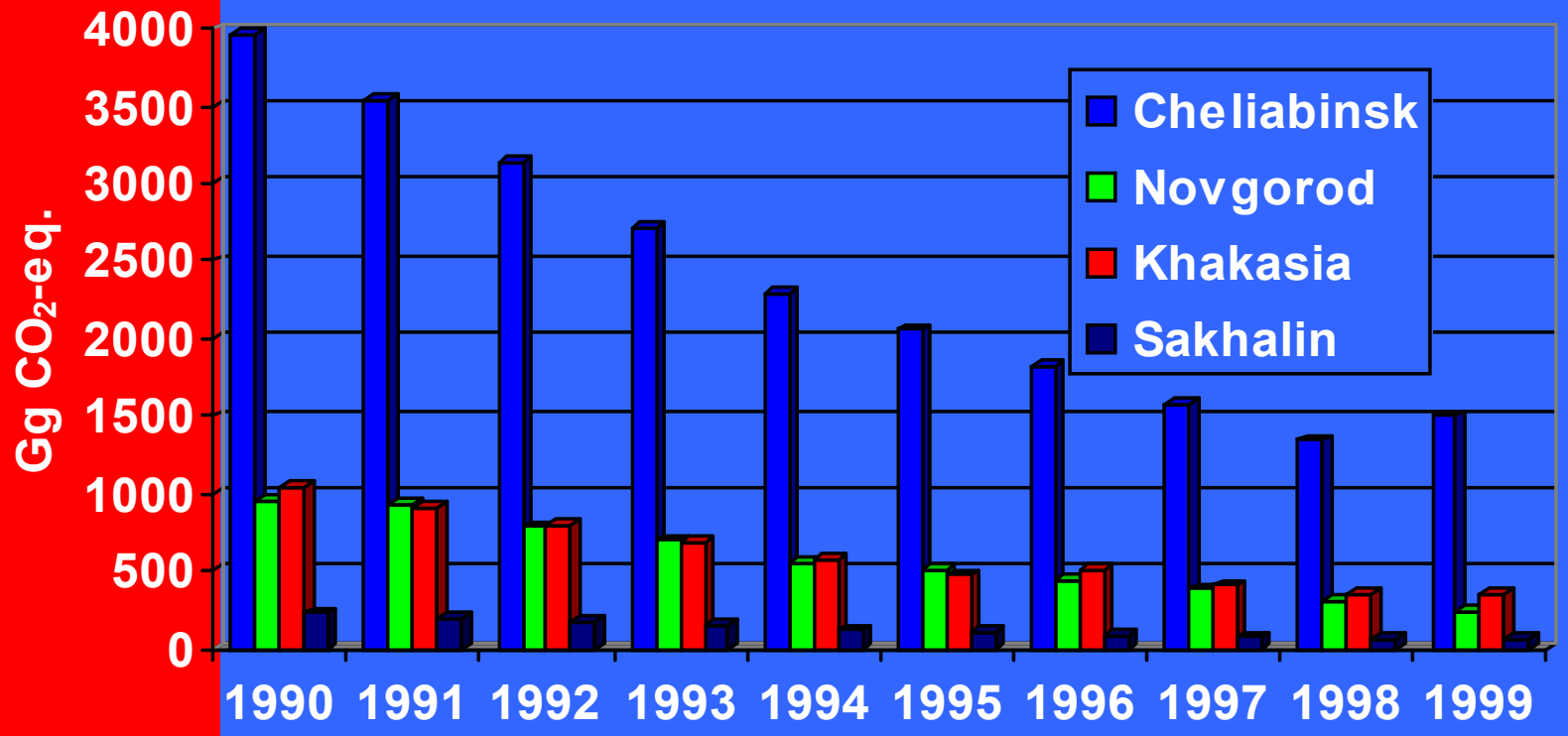


Potential problem: AAU allocation for new and growing enterprises

Agriculture - all Regions

- **Long-term downward trend**
- **Low quality of activity data, large uncertainty**
- **Difficult conditions for any business and in particular "GHG projects"**

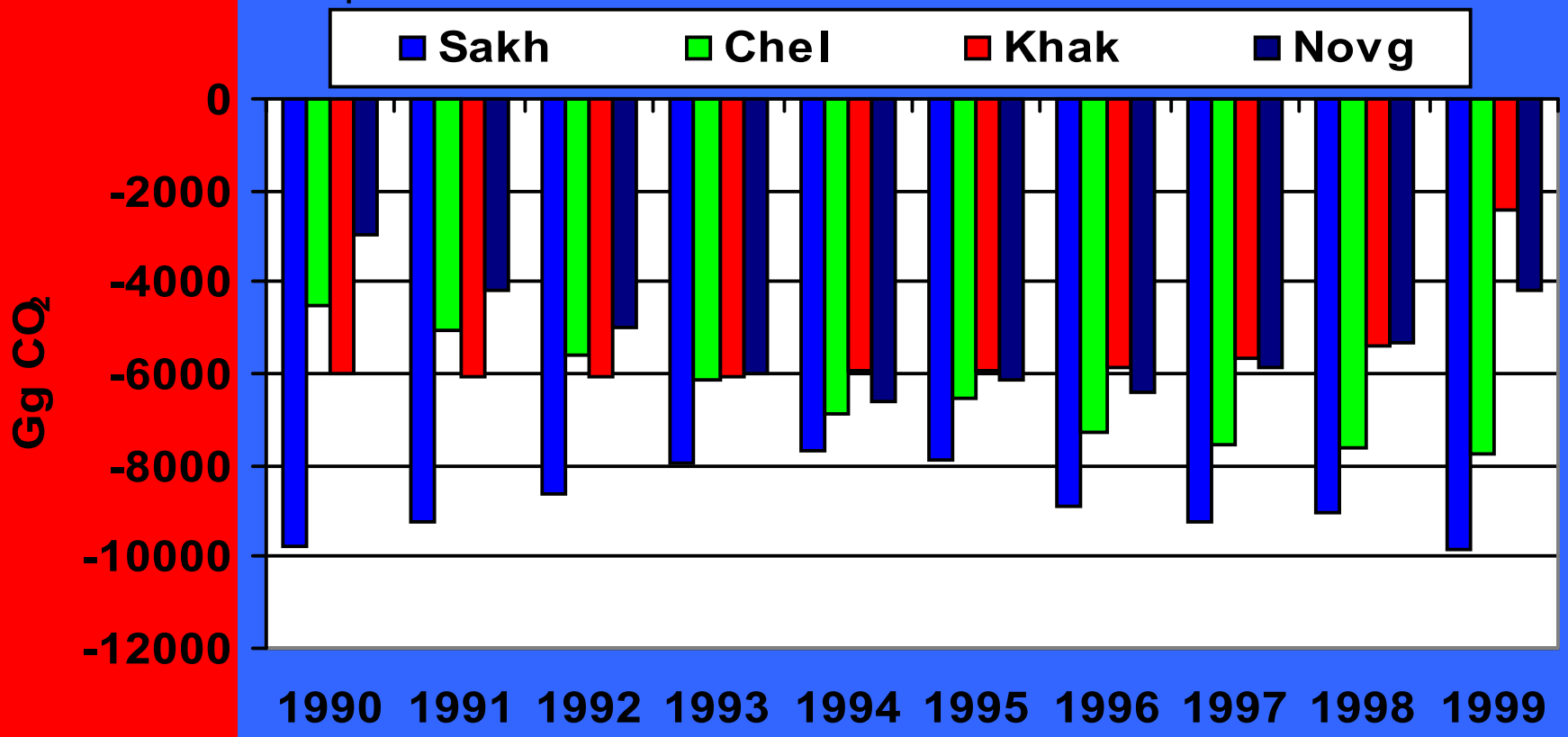
No chance for large-scale involvement in "Kyoto process" in near future



LUCF - all Regions

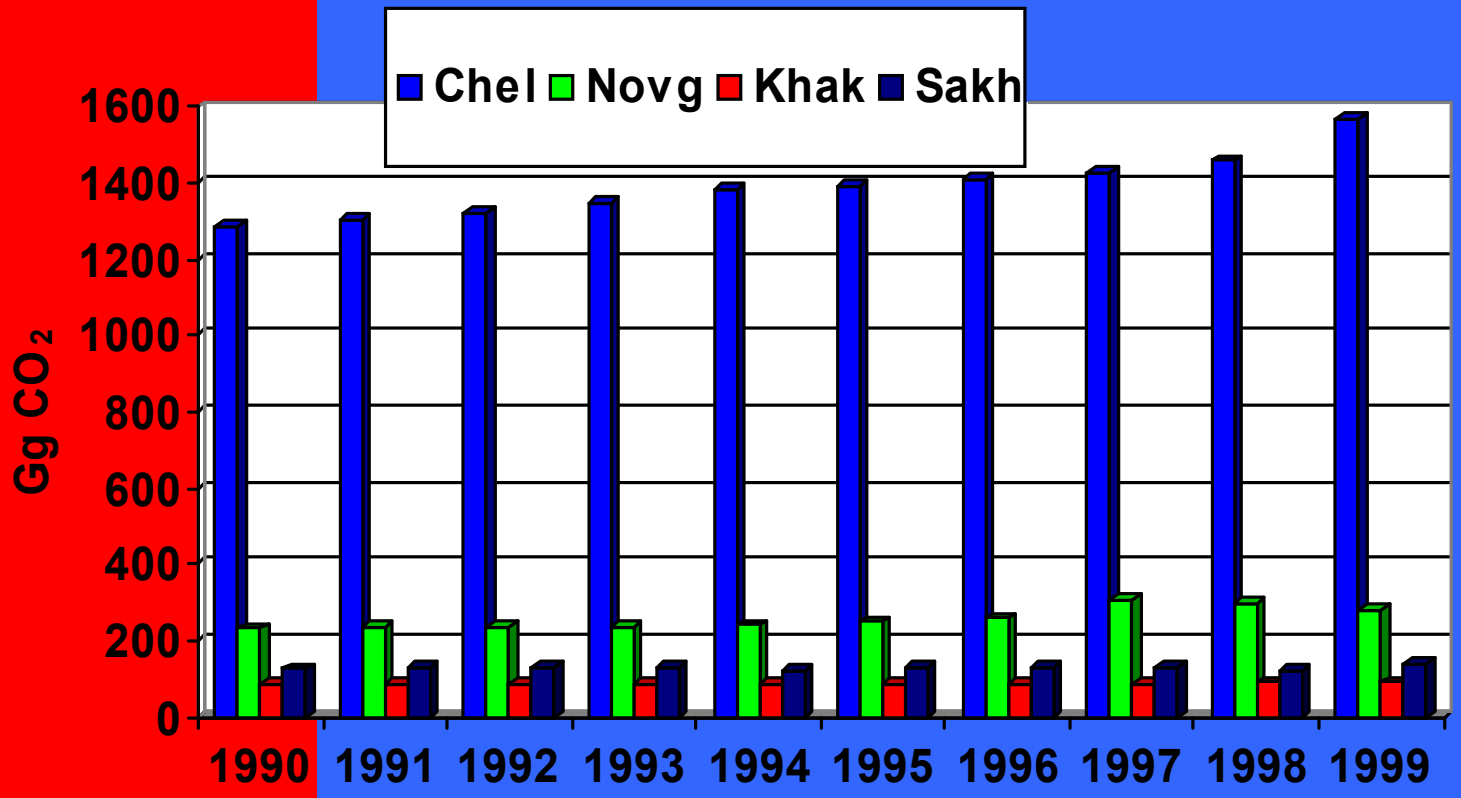
JI projects can be a tool for solving ecological problems and promoting reforestation and afforestation

- Very large values and variations, important role of forest fires
- Uncertainty is about +/- 30%, difficult to improve
- Institutional problems



Waste - all Regions

- **Moderate variations, moderate uncertainties**
- **Key role of regional projects on waste utilization**
- **Dependence on regional incentives for waste management; GHG reduction not driver**



Regional approach to inventory recommended. Large-scale GHG reduction activity unlikely

Main barriers

- No government decision on establishing National Inventory System
  - Ministry of Natural Resources has no formal mandate for GHG monitoring
- Absence of long-term incentives because carbon credits have no value under current international system
- Methodological problems
- Technical problems

Conclusions

Hybrid of regional and centralized systems for national GHG Inventory

Agriculture	
LUCF	**Centralized data collection**
Waste	
Energy	**Regional energy balances**
Industry	**Sector by sector with focus on major emitters**
New gases	**National-scale studies**

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Conclusions

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GHG Inventory Goals:

- precision
- completeness
- transparency
- fulfillment of IPCC Revised Guidance requirements

Meeting these goals is feasible and relatively low-cost for Russian Regions

Conclusions

Inventory creates infrastructure to stimulate GHG mitigation through:

- Joint Implementation
- Domestic ERU/AAU production

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Important factors for successful mitigation:

- Identify proactive “host” enterprises and address potential problems upfront
- Build awareness of decision-makers
- Enforce local legislation on GHG emissions

Recommendations

- **Decide on institutional home for GHG National Inventory System**
- **Identify responsibilities of Regions and Federal Institutions**
- **Finalize and adopt official Russian GHG methodology**
- **Prepare Russian Guidance on cost-effective approach to GHG Inventory (consistent with IPCC Revised Guidelines and "Good Practice")**