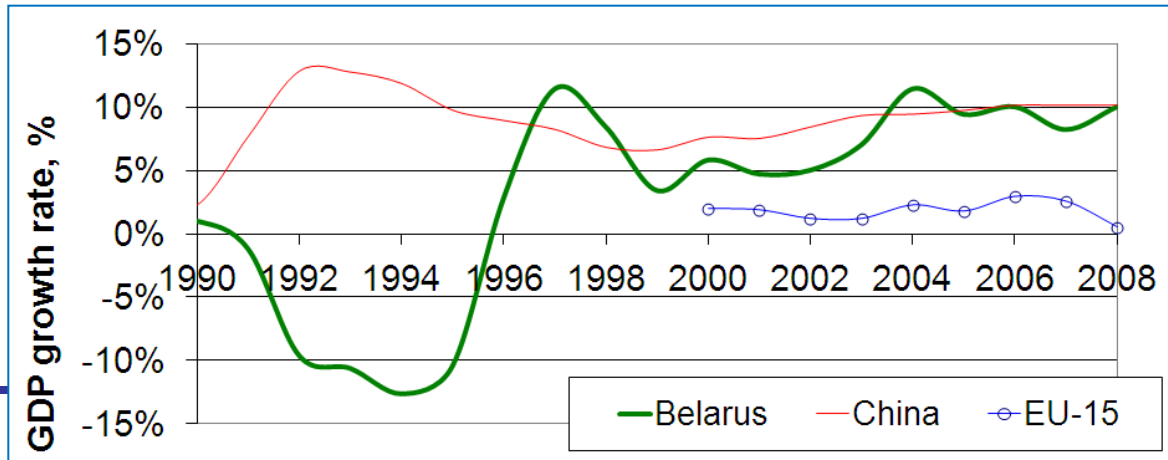
Patterns of climate change mitigation in the region: role of changes in economic structure vs. technological improvements

Alexandre GREBENKOV

SKPI National Coordinator
Belarus

EITs in brief

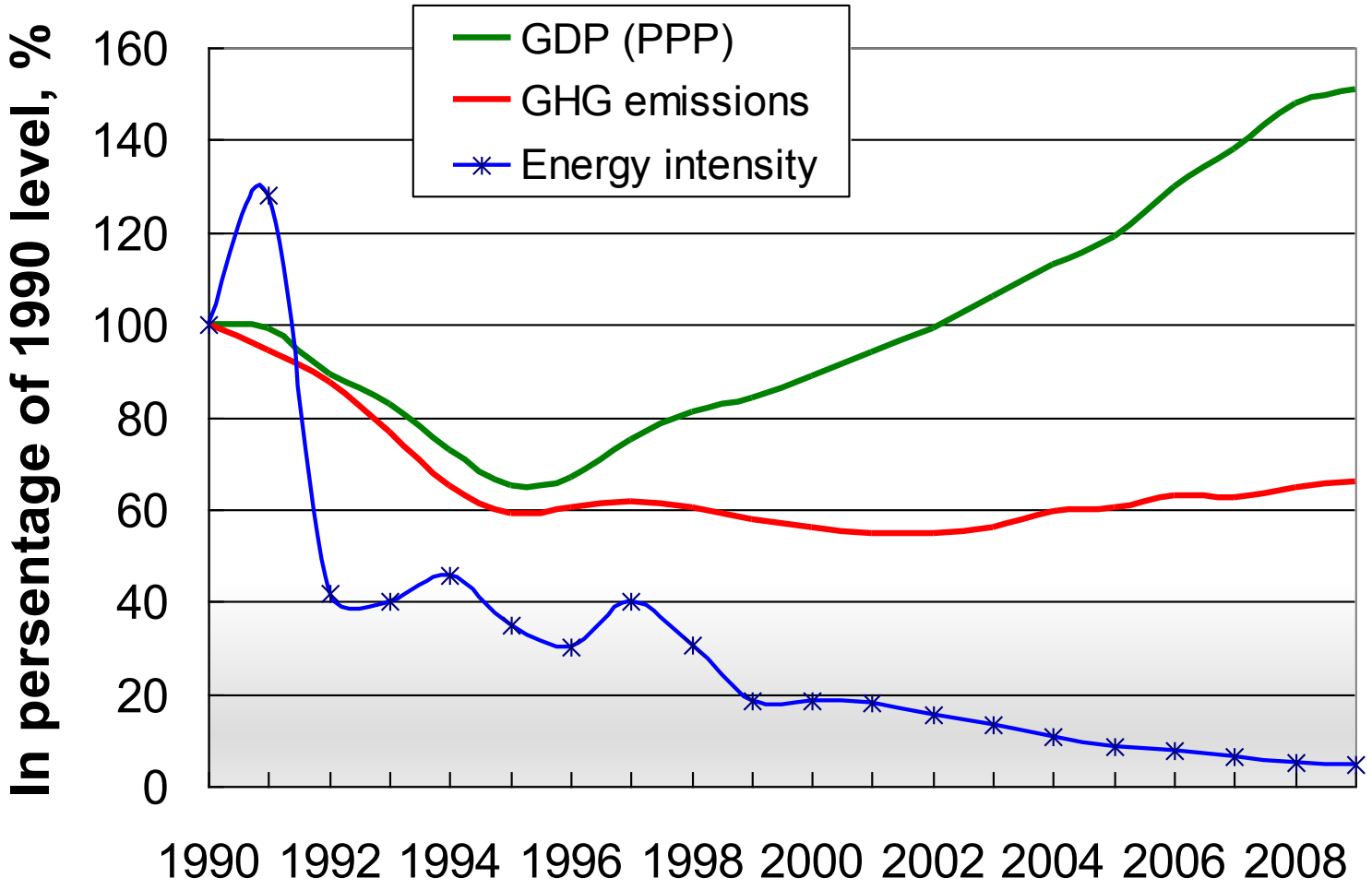
- Low income and GDP per capita (threefold lower than other Annex I countries in average)
- One of the highest GDP growth rate (8-19% annually)
- Low energy consumption per capita (twofold lower)
- Inefficient energy mix
- Moderate GHG emissions per capita (around 5-8 tCO2/ca)
- Significant potential for its reduction
- Underdeveloped infrastructure for new low-carbon technologies and insufficient experience to operate such technologies
- Low foreign investment share



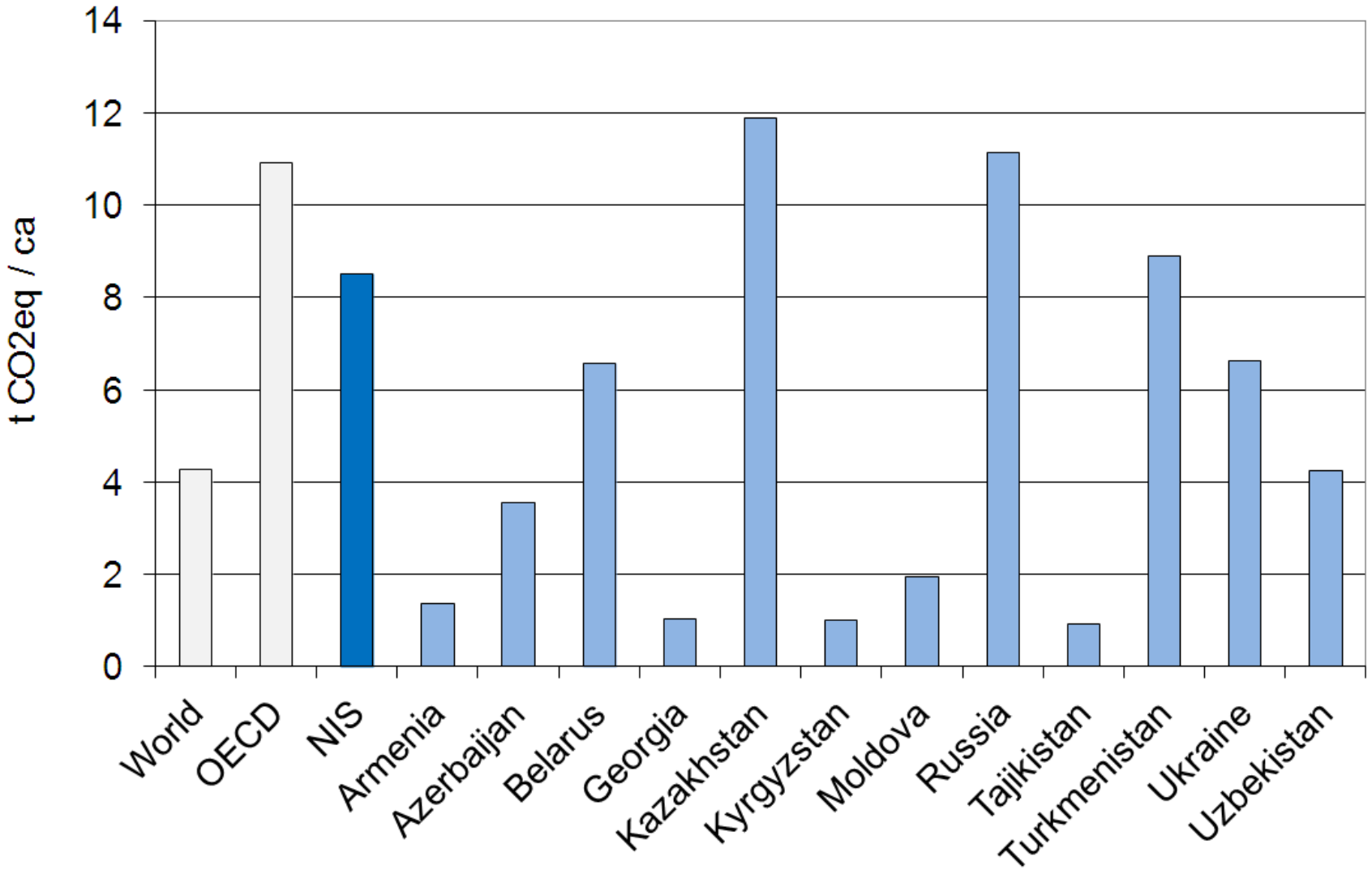
EITs energy mix in brief

- State sector still dominates:
  - the sector consumes more than 50% of total fuel and energy resources
  - fixed basic assets represent about a quarter of GDP
- Energy mix is an extremely centralized system
  - large condensing thermal power plants
  - large combined heat and power plants (CHP)
  - accumulated depreciation of main assets – more than 50%
  - losses in energy mix including auxiliaries – almost twice as much as in EU
- Centralized heat supply system consumes approx. 70-75% of gross energy consumption
  - pipelines with out-of-repair rate 50-60%
  - losses in heat supply – order of magnitude higher than in EU
- Simple cost-effective measures in energy efficiency improvement have already applied (< USD 100 per 1 t.c.e. saved)
- Current cost exceeds USD 700 per 1 t.c.e. saved

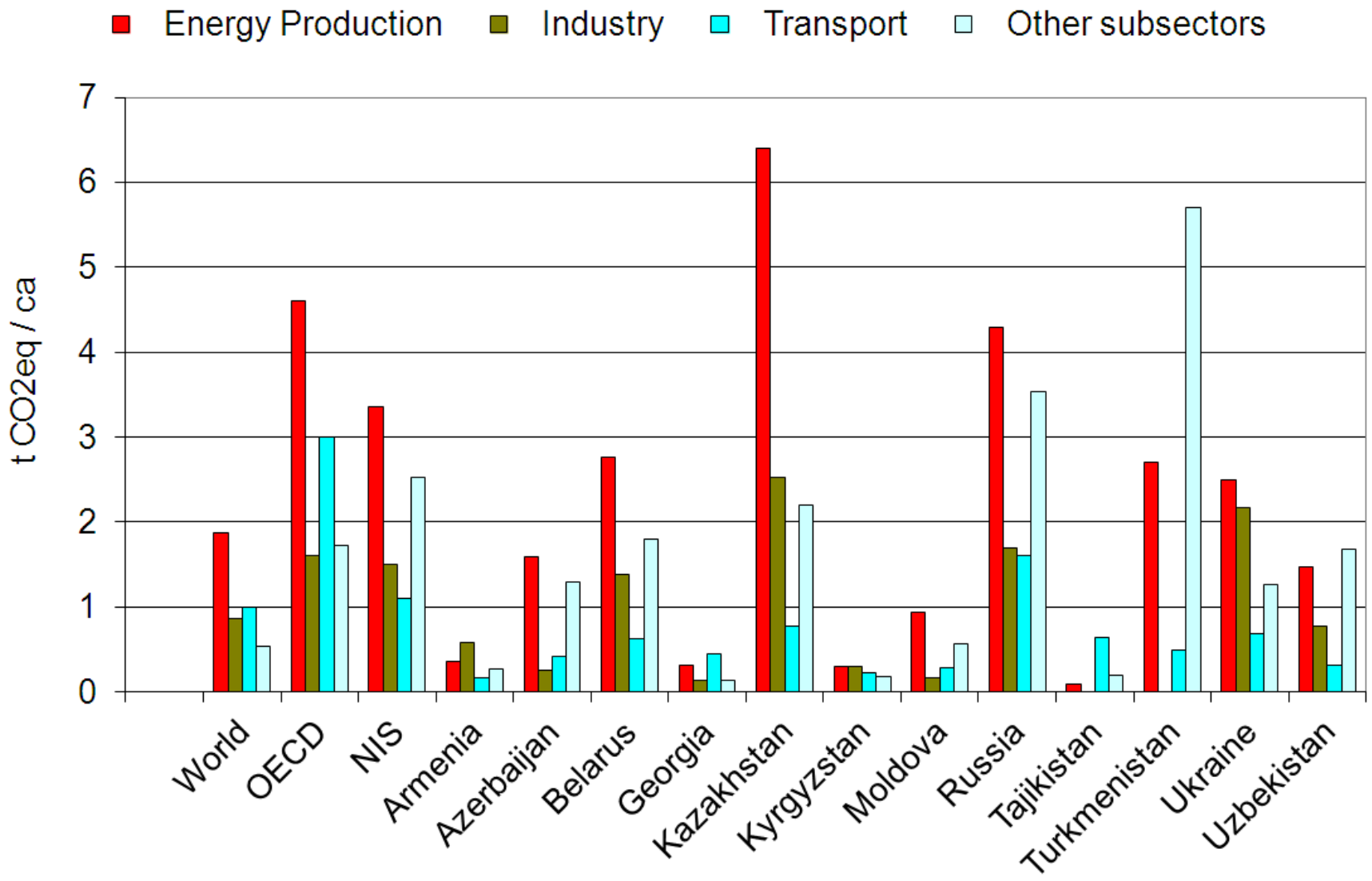
Main indices (Belarus example)



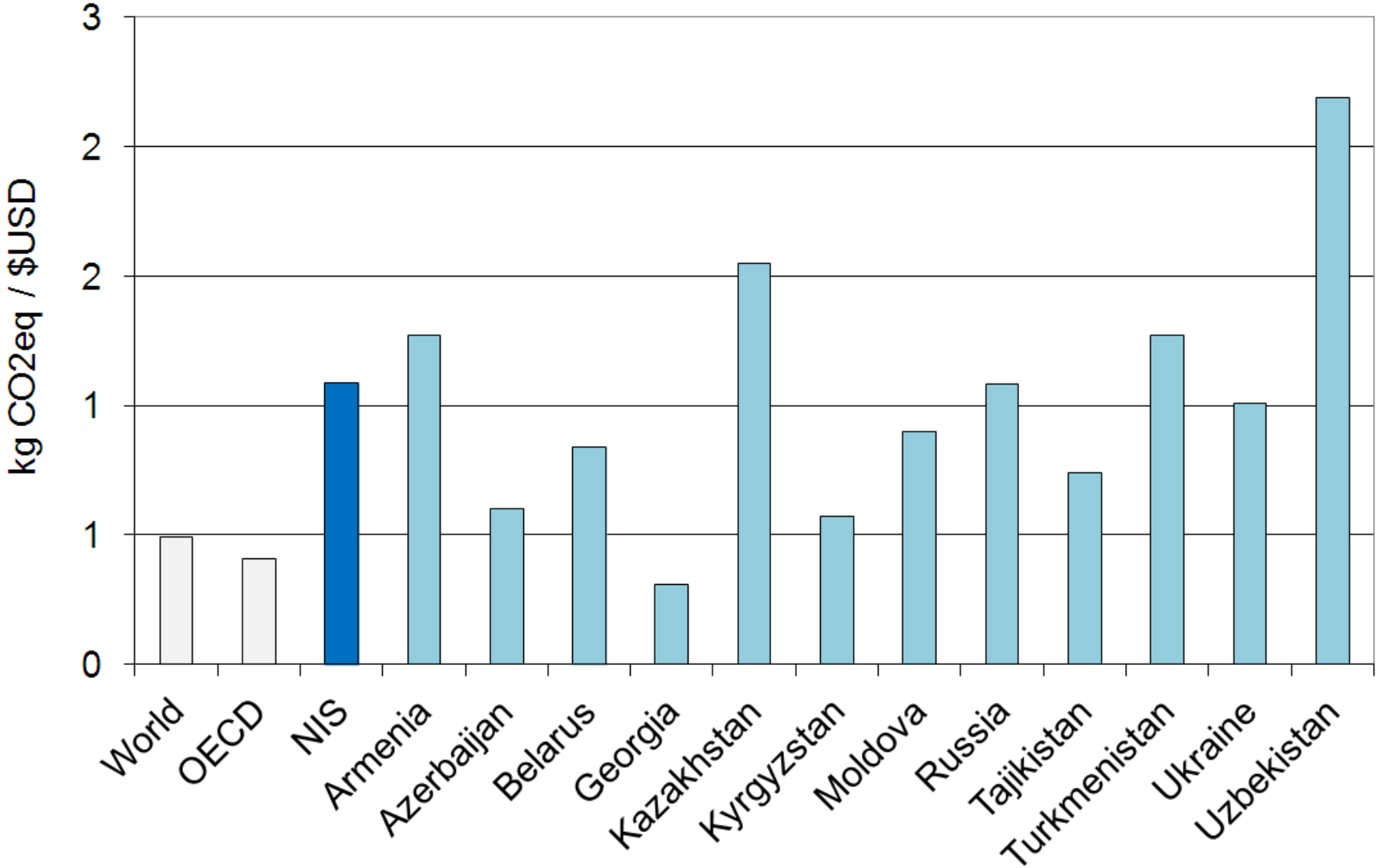
GHG emissions per capita



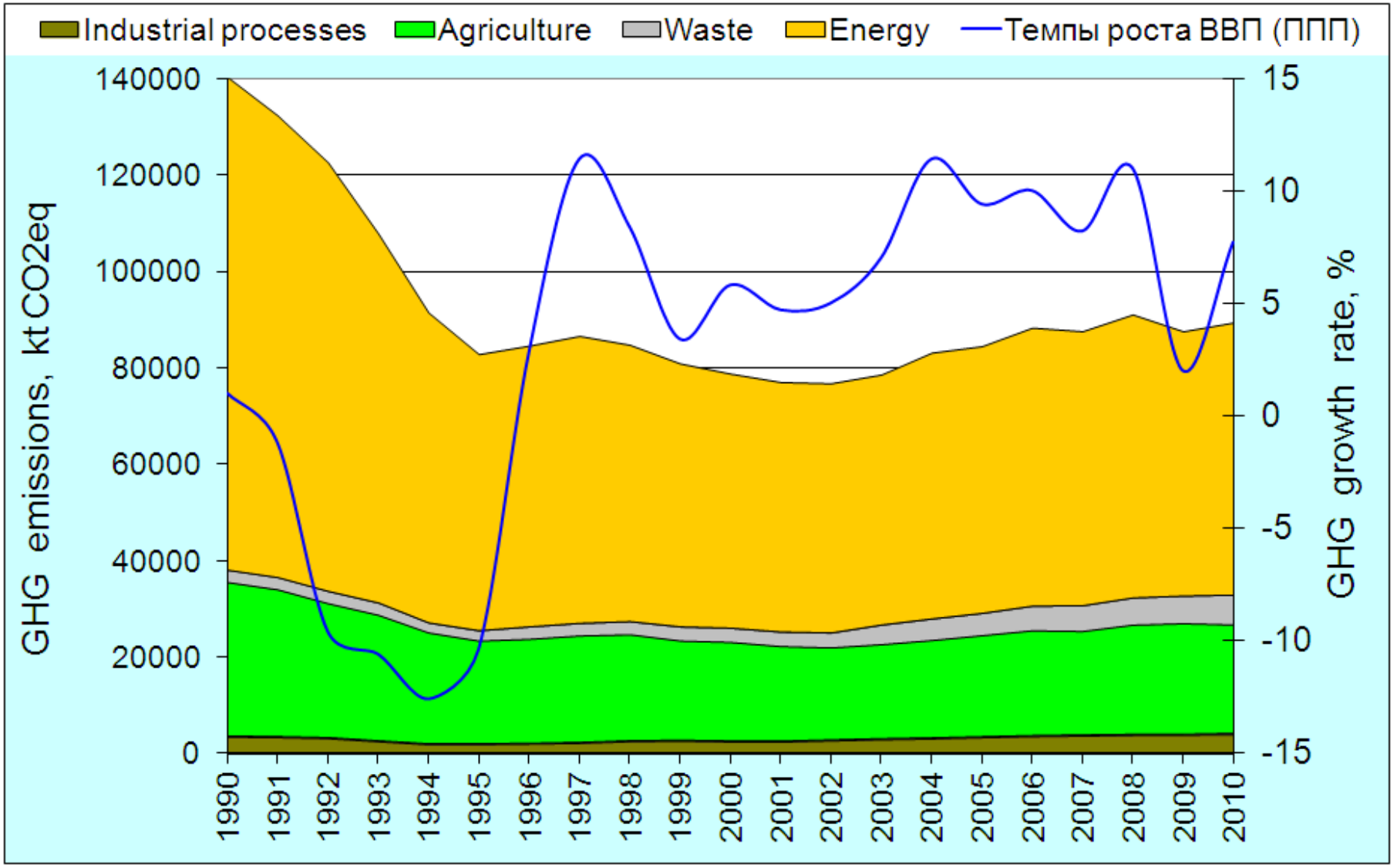
GHG emissions per capita in energy sector



GDP carbon intensity



GHG emissions: Impact of GDP growth rate



Energy efficiency is demanded

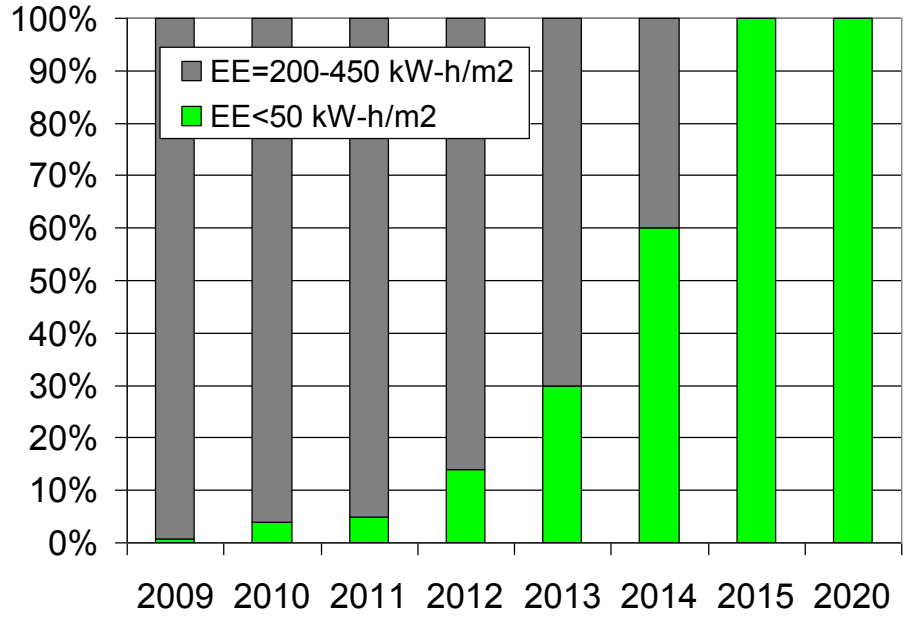
- From now on till 2020:
  - annual GDP energy intensity drop should be not less than 5-6% and show sustainable growing
  - energy saving should not be less than 5-6% of primary energy consumption
  - at least 5-fold carbon intensity reduction and doubled RES
- Until 2020 more than 3.4% of GDP should be directed to EE and RES
- Along with sufficient support to forest management, communal waste treatment and renewable energy the total investment in GHG emissions abatement should be not less than 5% of GDP
- State budget investment share (subsidies, repayable funds with 0%) should be not less than 20% of the total investment cost

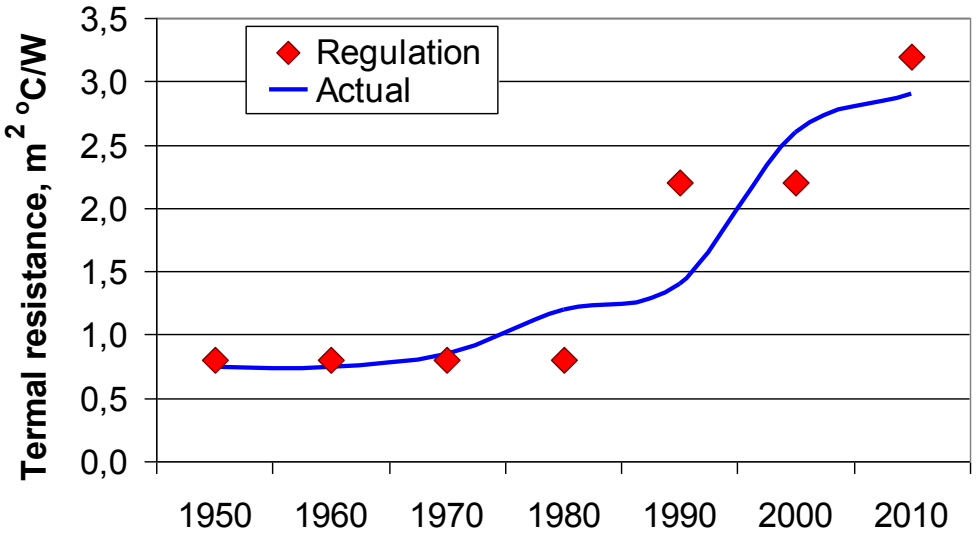
Mitigation in energy supply side

- Putting into operation of power generation equipment with combine cycle and co-generation
- Transmission of heat loads from boiler houses to CHPs and decentralization of peak heat supply
- Introduction of frequency converters for variable speed drives
- Thermal control of heat load
- Increase of the use of secondary energy resources (waste heat, high pressure, heat pump technology)
- Decrease energy loss in the grid

Mitigation in energy end-user side

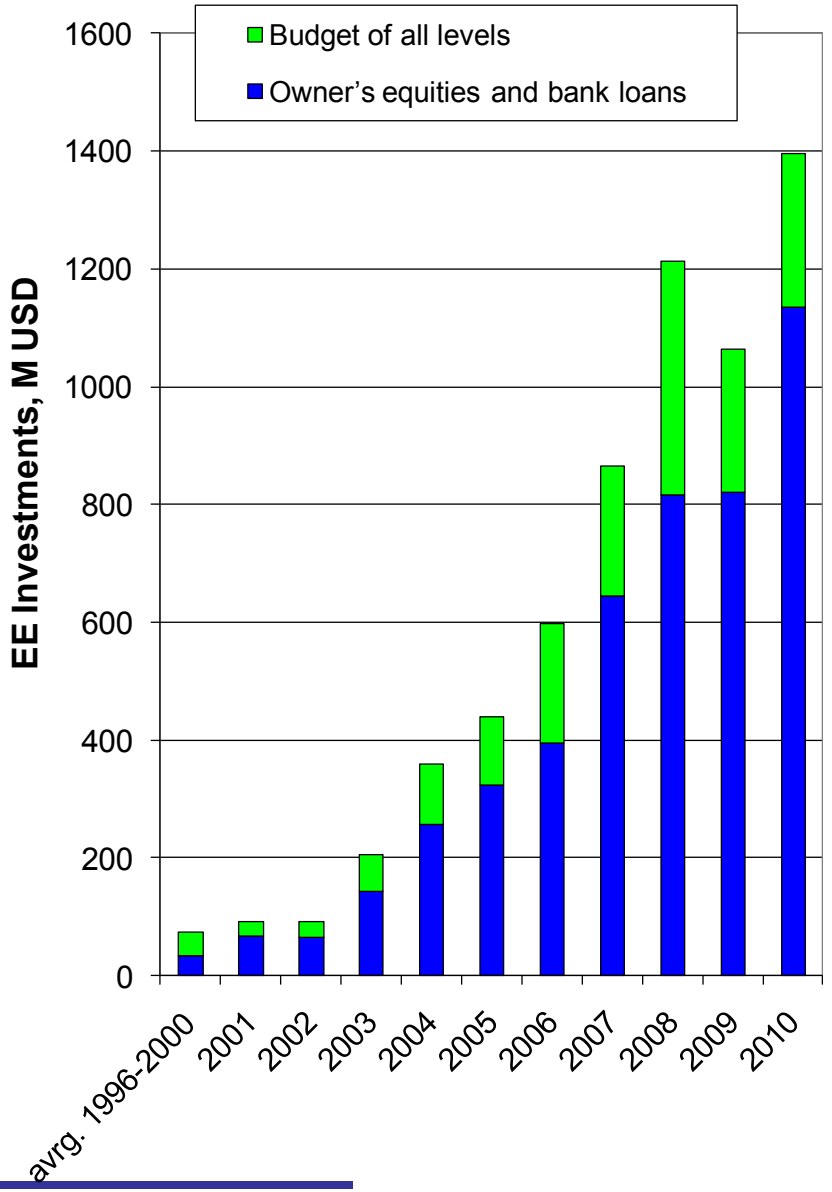
- Decrease heat loss in the pipelines
- Building standards
- Operation and maintenance standards
- Condominiums, record keeping
- EE measures:
  - temperature reduction in summer time (90 to 60°C)
  - durability 2-3 times higher, heat loss by 2-4% less
  - cost 1.3-3 times lower
  - substations, flow meter, heat recorder in each building
  - other measures





EE financing instruments

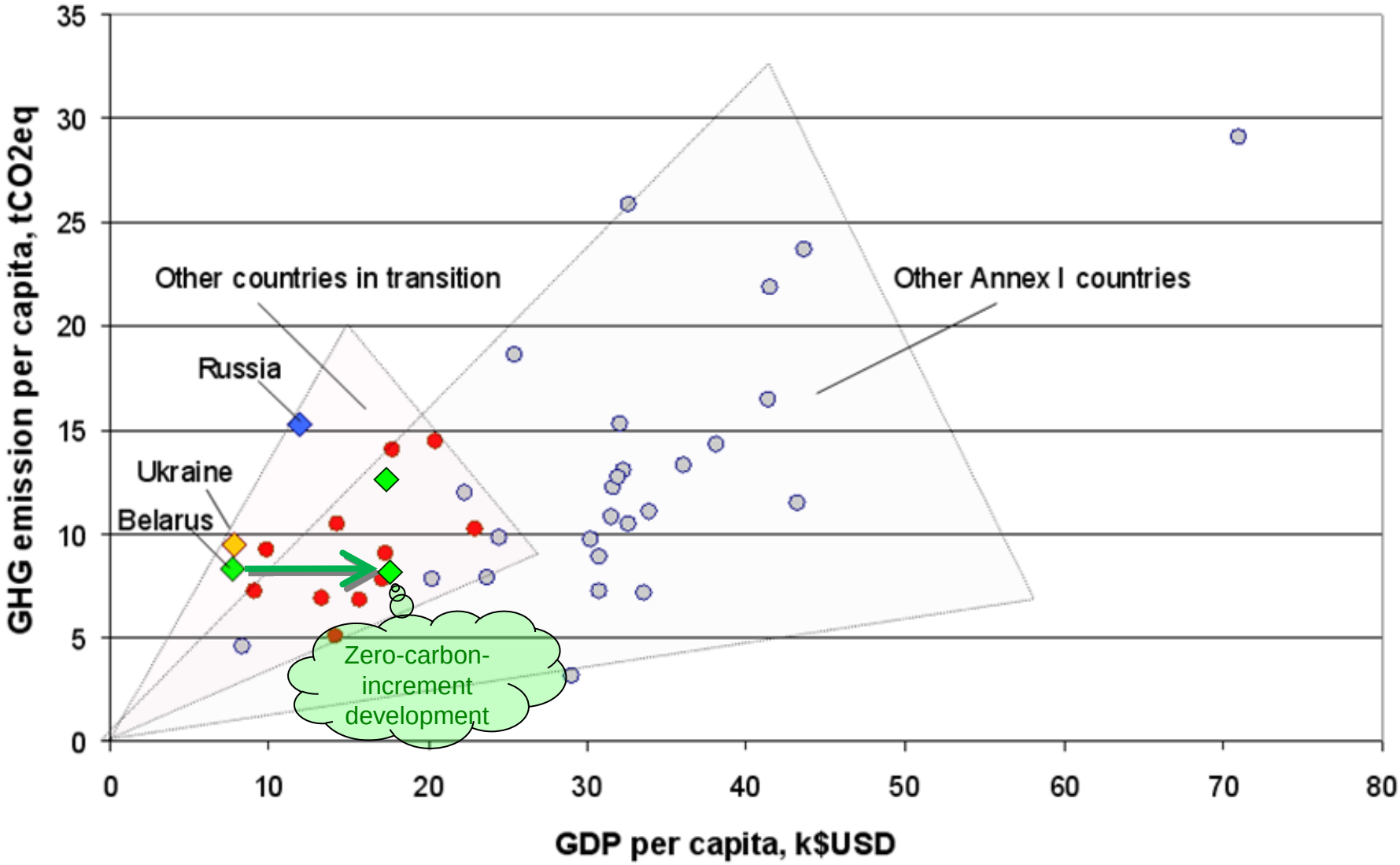
- 4 incentive mechanisms: subsidies, feed-in tariffs, tax remissions (0.5 of profit tax), soft loans
- EE investments
  - owner's equities
  - bank loans
  - Innovation Fund
  - Departmental Innovation Funds
  - state and local budget (repayable and non-repayable)
- Soft loans from banking sector
- Investments (ESCO)
- Revolving Fund: 7.5% (used to be 3-5%)



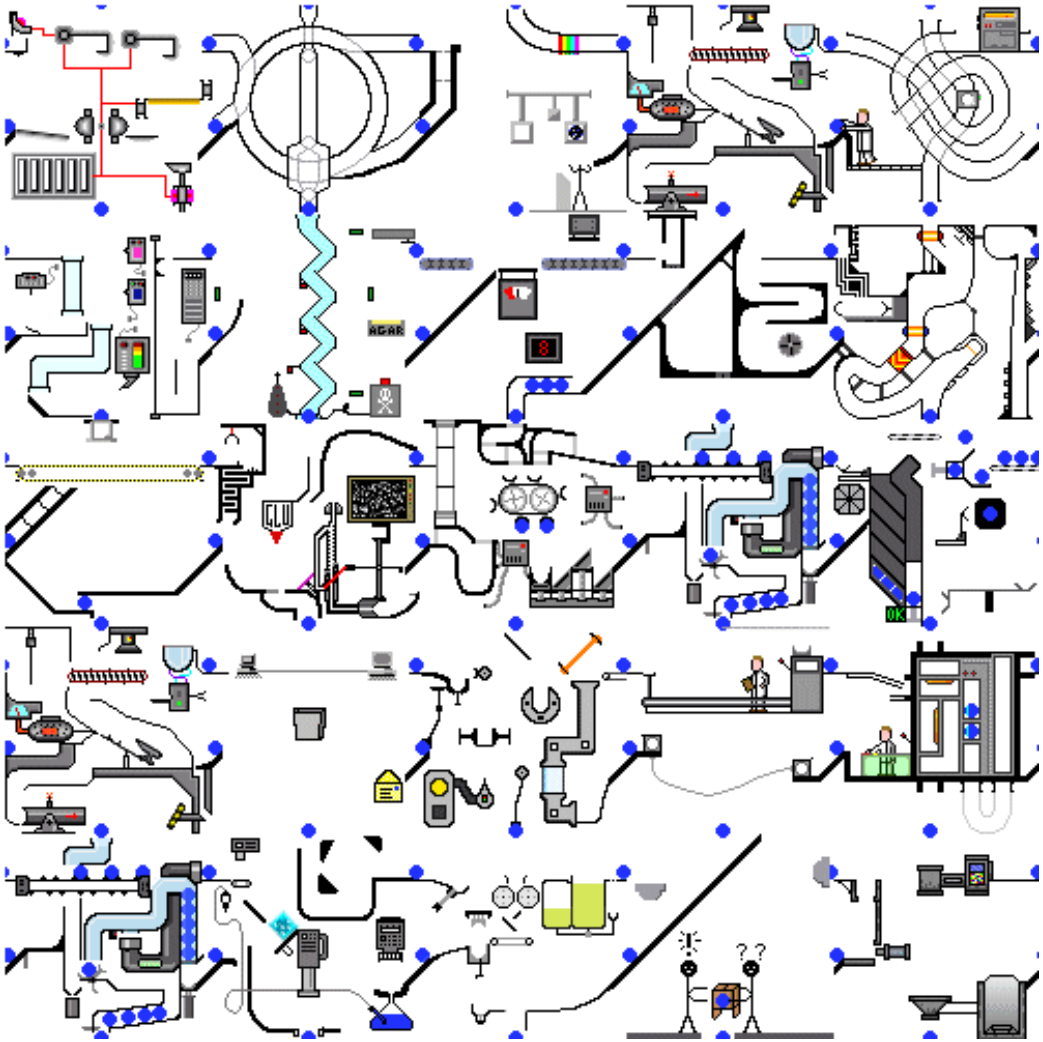
Barriers for green economy enhancement

- Low staff incentives:
  - a model of financial savings as a result of energy savings does not work in budgetary sector
  - energy norms are established on a basis of the level achieved
- Businesses and banks in general are not directly interested:
  - relatively high marginal cost
  - disincentive tariff mechanisms and cross subsidizing (still in place)
- Lacking regulations
  - need in laws on energy services (e.g. ESCOs), electric-power industry, cogeneration, heat supply
- Lack of motivation on supply side
  - financial flows by activities are not transparent
  - tariffs are unfair for independent producers
  - high level of centralization, need of mini-CHPs and «smart greed»
- Lack of knowledge and experience in EE project cycle and EE investment cycle
- Small experience in energy management

Triangle of GDP carbon intensity



Thank you



- тел.: (+37529) 685-2338
- sasha_grebenkov@mail.ru