

Environmental sustainability

►Indicator 1: Per capita energy sector CO2 emissions

Vector Value Calculations:

Ukraine's total emissions of carbon in metric tones from energy combustion in 1990 = 182.272 mtC³. Ukraine's population in 1990 = 51.9 m. Ukraine's 1990 emissions per capita = 3,512 kgC/cap⁴

Ukraine's total emissions of carbon in metric tones from energy combustion in 1999 = 76.61 mtC⁵. Ukraine's population in 1999 = 49.7 m. Ukraine's 1999 emissions per capita = 1,541 kgC/cap

Vector Value:

1999 vector value = (1,541 kgC/cap - 339 kgC/cap)/791 kgC/cap = **1.520**

1990 vector value = (3,512 kgC/cap - 339 kgC/cap)/791 kgC/cap = **4.011**

It should be mentioned that this trend is very delusive. The Ukrainian government tries hard to subsidise energy consumption in the most carbon intensive sectors of national economy. The emerging market in Ukraine eliminated some of the wasteful demand typical of centrally planned economies (such as over consumption of fuels and power, raw materials and transportation.) An appropriate fall in output attributable to the elimination of the worst loss-making activities may even be desirable for the environment as a whole. Unfortunately, those activities in many cases are precisely the ones that, through the over use of energy and natural resources and through pollution in production and consumption, allow earn foreign exchange, fig.1.1. That is why national government continues to subsidise carbon intensive exports through tax exemptions, low emissions charges and various indirect subsidies.

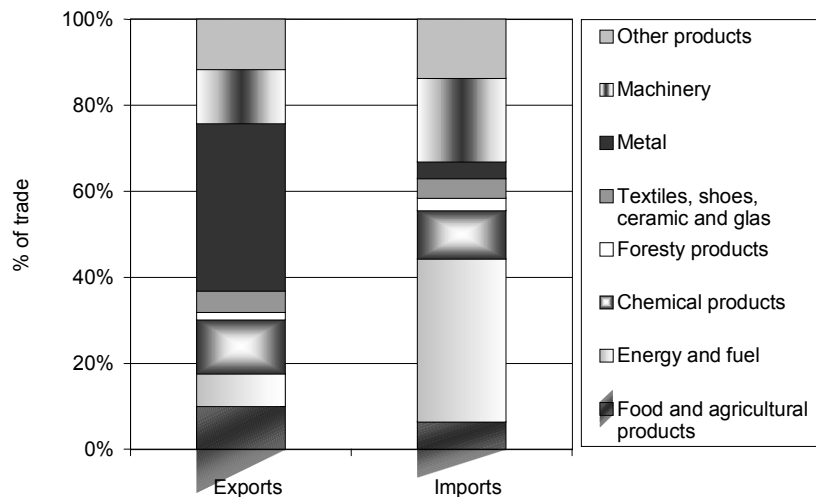


Figure 1.1. Ukraine's trade by product group⁶ (1998, in %)

³ Ukraine: The first national communication on climate change. Kyiv. 1998. It should be mentioned that the country never reported official CO2 emissions estimates before 1998. It is widely agreed that the country was accounted for 17% (180 MtC) of emissions from the former Soviet Union in 1990.

⁴ Energy policy of Ukraine. OECD. 1996 gives another data: 13.78 t of CO2 or 3.758 t of C

⁵ Calculations are based on First national communication on climate change. Kyiv. 1998 and estimates of Michael Mondshine, Mary Harris, Natalya Parasyuk and Konstantin Yemelianov, Climate Change Policy Development in Ukraine: An Evaluation of Existing Administrative Structures for Addressing Climate Change and Recommendations for Strengthening these Administrative Structures. May, 2000.

⁶ Ukraine's Economic Trends, Intelnews/Aug. 12, 1999.

Since the launch of economic reforms and until now there has not yet to be any signs of increased efficiency in the use of energy resources. Ukraine's energy intensity in terms of GDP has actually risen by a factor of 1.56, while it has fallen in other transitional economies, fig 1.2. This is a direct result of subsidising carbon intensive sectors of the economy. Indeed, if goods and services need not be paid for their full market prices, then it will not provide an incentive to conserve resources, and no savings will be achieved.

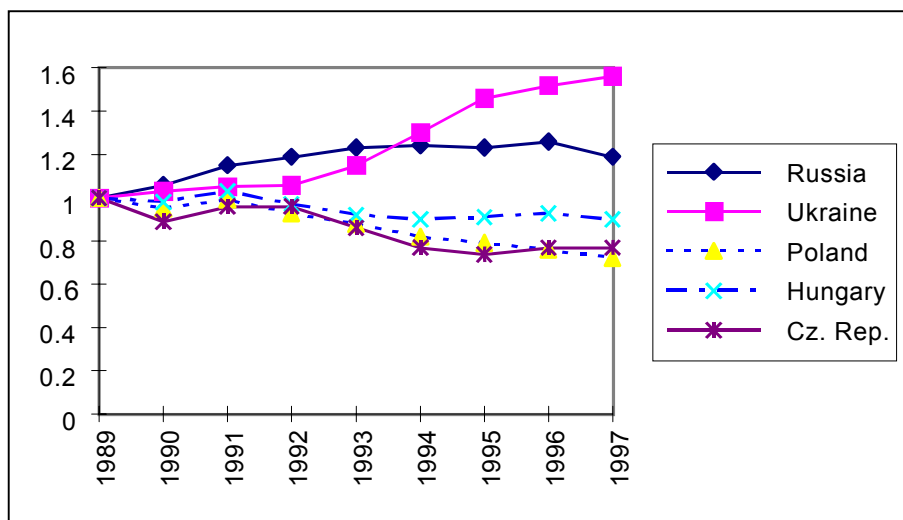


Figure 1.2. GDP energy intensity by international comparison ⁷

In July 1999 President Kuchma signed the Law "On Experiment in Mining and Metallurgical Sectors of Ukraine" that gave carbon intensive and polluting industries highly favourable tax and emissions charges breaks. Here are two more demonstrative examples. First, just recently our President signed the Law "On Changes to Several Laws of Ukraine Regarding the Taxation of Extraction and Selling of Rude Oil and some of its Derivatives", No.1962-III of September 21, 2000. In accordance with the law, a zero level custom duties on imported oil and zero level VAT on domestic oil have been set up. Second, in the State Budget of Ukraine for year 2001 subsidies for the fuel and energy resources consumption have been increased for 760 m UAH (or in 60%).

Current subsidies in the Ukrainian economy encourage over-consumption of energy and material resources. By distorting the market prices, subsidies tilt the playing field in favour of more resource-intensive technologies, penalising efficiency measures and renewable energy sources. They also delay the adjustment that normally takes place as a commodity becomes scarcer. Moreover, the policy of "dirty" subsidies caused environmentally-unfriendly structural changes in Ukraine's economy (see table 1.1 – next page).

⁷ German Advisory Group on Economic Reforms with the Ukrainian Government.

Table 1.1. Structure of Ukraine's industrial output within the two groups of sectors⁸, %

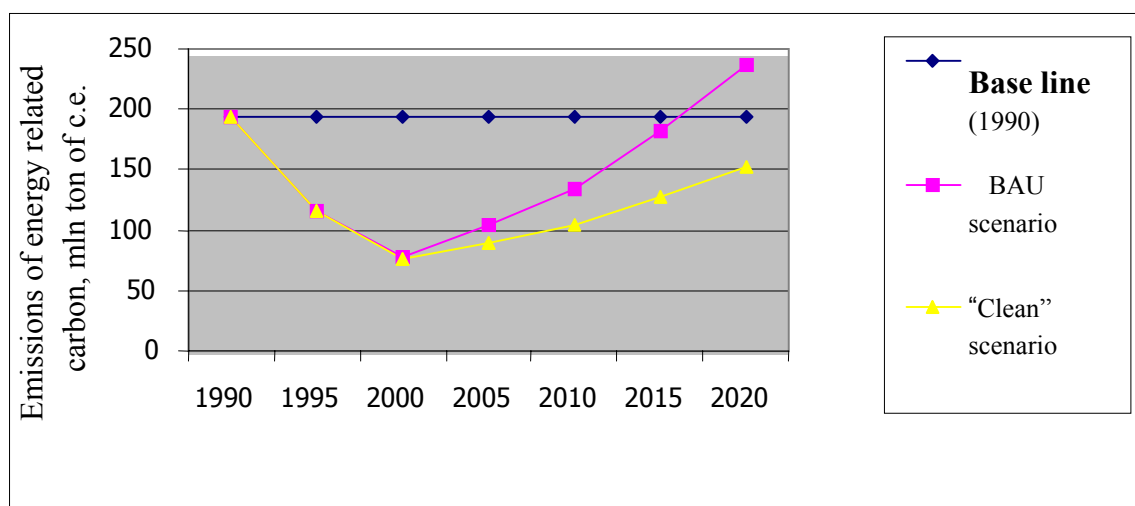
Groups of industrial sectors	Share in output, %		
	1991	1994	1998
I group Fuel and energy complex, ferrous metallurgy, chemical, petrochemical and cement industry	23.2	49.5	55.8
II group Machine building and metal processing, forestry and Wooden industry, light and food industry	76.8	50.5	44.2
Total	100.0	100.0	100.0

We elaborated two scenarios of future structural changes in Ukraine's industry: BAU scenario and «clean» scenario, table 1.2:

Table 1.2. Two scenarios of structural changes in Ukraine's industry

Type of scenario	Share of output, %		
	2005	2010	2015
BAU scenario:			
I group	60	66	75
II group	40	34	25
Total	100	100	100
«Clean» scenario:			
I group	45	35	30
II group	55	65	70
Total	100	100	100

Both scenarios allow keeping the same dynamics of GDP growth, but emissions of energy related carbon would be substantially different (fig. 3) as the two groups of sectors suppose different energy intensity.

**Figure 1.3. Forecasts of carbon emissions in accordance with BAU and «clean» scenarios⁹**

⁸ Mykola Chumachenko. Problems of Structural Policy in Ukrainian Industry/ Proceedings of the VII International Conference «Features of Economic Policy of Post-socialist Countries under the Globalization; A Case Study of Ukraine». Kyiv, Nov. 25-26, 1999.

⁹ Modeling of scenarios and assessment of carbon emissions has been made by Vladimir Dounaev on the base of Victoria Software.

► Indicator 2: Most significant energy-related local pollutants

Vector Value Calculations:

Ukraine's 1990 total emissions of SO₂ in metric tonnes from fossil fuel combustion at TPP = 2.53 Mt¹⁰. Ukraine's population in 1990 = 51.9 million. Ukraine's 1990 SO₂ emissions per capita = 48.7 kg/cap.

Ukraine's 1999 total emissions of SO₂ in metric tonnes from fossil fuel combustion = 0.76 Mt¹¹. Ukraine's population in 1999 = 49.7 million. Ukraine's 1999 SO₂ emissions per capita = 15.3 kg/cap

1990: 48.7 kg of SO₂ per capita, and in 1999: 15.3 kg of SO₂ per capita. The sustainability objective is one-tenth of 1990, or 4.87 kg SO₂ per capita. Zero to one vector value equals $48.7 - 4.87 = 43.83$ kg SO₂ per capita.

Vector Value:

1990 = $48.7 / 43.83 = \mathbf{1.100}$

1999 = $15.3 / 43.83 = \mathbf{0.349}$

Again, this trend is delusive. If we compare GDP growth data (table 2.1) with dynamics of SO₂, NO_x and particulate matters emissions in fuel and power sector (tables 2.2, 2.3), we can conclude that de-coupling of industrial growth and emissions is still a mirage.

In 1992-1997 Ukraine reduced its sulphur dioxide emissions mainly due to general decline of its economy.

Table 2.1. GDP as a key macroeconomic indicator (% change from previous year)¹²

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Growth, %	-16.8	-14.0	-23.0	-12.5	-10.0	-3.2	-1.7	-0.4	6.0

It should be mentioned that the failures to impose the polluter pays principle also could be regarded as a subsidy. The difference between the EU rates of emission charges of energy-related pollutants, and Ukraine's rates could be considered as implicit subsidies, table 2.4.

¹⁰ Ukraine: Suggested priorities for environmental protection and natural resource management. World Bank Report No. 12238-UA. 1993.

¹¹ State of the environment in Ukraine for 1999. National Report. Kyiv. 2000.

¹² Statistical yearbook of Ukraine, Ukrainian economic survey and others.

Table 2.2. Dynamics of SO₂, NO_x, hydrocarbons and VOCs emissions in fuel and power industry in 1997-1998¹³.

Criteria pollutant	Yearly emissions, kt		Share of total emissions %	Change of emissions (as compared to the previous year)	
	1997	1998		kt	%
SO ₂	780.6	718.3	70.2	-62.3	-8.0
NO _x	209.0	187.7	56.4	-21.3	-10.2
Hydrocarbons and VOCs	4.3	2.2	0.5	-2.1	-48.8

Table 2.3. Dynamics of SO₂, NO_x hydrocarbons and VOCs emissions in fuel and power industry in 1998-1999¹⁴.

Criteria pollutant	Yearly emissions, kt		Share of total emissions %	Change of emissions (as compared to the previous year)	
	1998	1999		kt	%
SO ₂	718.3	761.3	74	+43.0	+6.0
NO _x	187.7	193.4	58.1	+5.7	+3.0
Hydrocarbons and VOCs	2.2	3.4	0.8	+1.2	+54.5

Table 2.4. Selected emission taxes/charges of EU Member States and Ukraine¹⁵ (1999).

	EUR/□ SO ₂	EUR/□ NO _x	EUR/□ CO ₂
Denmark	5400.00		13.40
France	27.40	22.90	
Italy	53.20	105.00	
Sweden	6940.00	4630.00	42.80
Ukraine	9.63	9.63	

In the practice of environmental policies an increasing number of Western European countries have implemented taxes based on energy/carbon content of the energy products and services (Sweden, Norway, The Netherlands, Denmark, Finland, Austria, Germany and Italy). Several other countries, like Switzerland, France and the United Kingdom, are currently discussing proposals for their implementation.

¹³ State of the environment in Ukraine for 1999. National Report. Kyiv. 2000.

¹⁴ Ibid.

¹⁵ Cabinet of Ministers Decree "On Emission Charges Base and Rates", No. 303, 1 March 1999.
<http://europa.eu.int/comm/dg11/enveco/index.htm>

If the EU countries introduce more stringent emission charges and taxes on energy products (and the derived “implicit” carbon taxes), then they impair their comparative price advantages for energy/carbon intensive commodities (i.e., iron ore, steel, mineral fertilisers, petrochemical products, electricity, etc.). Exports of these commodities immediately fall, and soon domestic production will be also reduced. Finally, a re-allocation of resources into de-carbonised (i.e., environmentally benign) sectors will take place and, as a result, environmental quality in these countries will improve.

What kind of structural adjustment will take place in the country like Ukraine that does not pursue (for several reasons) energy and carbon taxation? Obviously, that its comparative price advantages will rise and it will increase the production of energy/carbon intensive (i.e., environmentally adverse) goods. As a result, a re-allocation of domestic resources and additional foreign investments will occur in favour of energy and carbon intensive industries (see table 1 in the previous section). Finally, environmental quality in the country will worsen.

Unfortunately, a few people in the Cabinet of Ministers of Ukraine (including the Ministry for the Environment) do understand that environmental policy of foreign countries, say European Union, can affect environmental quality in Ukraine. This comes about by industrial specialisation and trade. Unconditionally, such policy is fraught with further environmental deterioration due to increase of SO₂, NO_x and other local emissions.