VI. ENVIRONMENTAL TRANSITION

European Commission

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VI.1. OVERVIEW

Environmental transition entails systemic changes in the way we produce and consume, which allows society to move towards a more sustainable and resilient economy and represents a unique opportunity for countries to build back better following the COVID-19 crisis. Although climate change, unsustainable resource use, biodiversity loss and environmental degradation require urgent action, governments need to pursue investments and reforms that support low-carbon, resilient investments, backed up with efficient climate policies. In addition, the EU's efforts towards moving to a climate neutral economy by 2050 are not enough to meet the global challenge of addressing the global problem of climate change: the COP26 climate summit stressed the need for global actions from all countries.

On the other hand, the Green transition is an enormous growth opportunity, as all countries need to switch to cleaner energy use, manufacturing, and consumption.

At the EU level, the Green Deal sets the blueprint for the green transformation[65], which will be implemented on the ground up to 2030 through the 8th Environmental Action programme. It enshrines a mechanism to monitor economic, social and environmental progress 'beyond GDP'.

Environmental issues can be interlinked with other dimensions of the TPI (for instance health and labour market transitions to support reskilling and upskilling or digitalisation). Delivering on the other transitions can have some synergies with the Environmental transition.

The upper goalposts for this transition have been set at moderate levels to gauge progress, but they could be tightened in future editions. As a result, progress in Environmental transition is only a provisional assessment (**TABLE 12**).

Environmental transition also embeds different aspects, from emissions reduction and increase energy productivity, to protect biodiversity and decrease material consumption. The Environmental pillar covers different objectives contributing to the green transition.

The new edition of the index aims to consider environmental spillovers by adding material footprint (relevant for SDG 12 - Responsible consumption and production) to sub-pillar 3.3, aiming at better gauging the objective to ensure a sustainable use of resources and to foster the circular economy. This sub-pillar has been now renamed 'Material use', to track to what extent production is decoupled from material use (i.e. becoming more resource efficient) and the overall material impact of the consumption of goods (including the goods imported net of goods exported).

The Environmental transition is a global phenomenon endeavour. For instance, material use raises issues related to personal choices and way of life. This translates into a larger question such as to what extent can GDP growth be decoupled from material use and to what extent internal consumption impacts other countries in terms of material extraction, pollution and degradation of ecosystems, thus increasing pressures on the planet. Innovation and eco-design, new business models and the circular economy, digitalisation, and more responsible consumer behaviour and informed consumer choices all contribute to the objective of reducing the material footprint. The systemic changes in the way we consume and produce will boost a new growth model, which is good for the prosperity (economy competitiveness), the people (wellbeing and health) and the planet (safe operating space within the planetary boundaries).

65 European Commission, The European Green Deal COM(2019) 640 final, 2019.

Statistical specificities

When adding material footprint, the Environmental pillar appears to be less correlated with the other transitions (0.01 versus 0.43 reported in the first edition, considering the latest available year of data only), showing even more the need for a major shift in environmental policies. The current results under the Environmental pillar should make us question the sustainability of our consumption patterns. The new indicator 'material footprint' has a unique characteristic in that it is negatively correlated to the index. As mentioned by the JRC audit, 'the Environmental pillar shows an apparently independent behaviour in respect to the other three. As a consequence, the Environmental pillar contributes less to the index than the other three pillars'.

In addition, 'the Environmental pillar proves its specificity again by causing an average rank change of 7.4 positions. In effect, this addition implies important shifts in scores in the Environmental pillar. Compared to the previous edition, scores decrease mostly for high-income countries, while lower middle-income countries tend to benefit from this addition. This result classifies the Environmental pillar unequivocally as impactful, and it is due to the diversity of this pillar compared to the rest of the index' (JRC audit in Appendix V).

This statistical anomaly was expected and is conceptually sound on two grounds. First, the rationale for the inclusion of Material footprint is to include a factor of adjustment to resource productivity, as both indicators evolve around the same concept of Material use. On one side, resource productivity represents the materials used directly in production in an economy compared to GDP. On the other side, material footprint is calculated based on the extraction of raw materials in external countries to meet the country overall material demand, adding the raw material equivalent of imports net of the raw material equivalent of exports, in per capita terms.

The second conceptual rationale relates to public policy. In effect, most countries are in a declared path of bending the curve of consumption and use of raw materials, just like they are on a path of bending the curve on GHG emissions. So even if the levels of material use as still high and for some countries in a growing path, the expectation is to see these indicators decreasing over time, a trend this index is in a position to capture with the backcasting of data over a decade.

Environmental transition, leaders and strong performers

According to the scores based on the new edition, only the United Kingdom achieves a leader position in Environmental transition, with leader and strong transition performances in all four sub-pillars.

Nineteen countries are strong performers, as well as the EU-27. Four of them (Colombia, the Philippines, Morocco and Nigeria) are outside Europe. The performance of Albania, ranked 4th, is commendable as Albania is overall 31 in the TPI index. Albania is leader in three sub-pillars, with a moderate position in Material use. Since 2011, Albania achieved significant progress in the adoption of a modern environmental legislation, driven by the efforts to approximate the EU environmental acquis, as the country was granted candidate status to the European Union in 2014[66].

Countries in strong transition show quite balanced performances across all sub-pillars, apart from material use, where Denmark, Latvia, Portugal, Greece and Romania are weak performers, and seven other countries are in moderate transition. Several countries are environmental leaders for several dimensions. Malta, Italy, Denmark, Ireland, the Philippines, Colombia, Croatia and Nigeria are leaders in two environmental indicators.

66 UNECE, '*3rd Environmental Performance Review of Albania*', September 2018

The overall picture shows significant progress in energy productivity and reasonable progress in the reduction of greenhouse gas (GHG) emissions: Forty-four countries as well as the EU-27 and world averages are leaders or strong performers in Emissions reduction. In contrast, the remodelled sub-pillar Material use becomes an even weaker point, with only three countries as leaders or strong performers (Italy, the Netherlands and the United Kingdom,) and 57 as moderate or weak performers, including the EU-27 and world averages (compared to 40 last year with only resource productivity). Energy productivity falls in between with 24 countries, as well as the EU-27 in leader or strong transition, and 33 countries, as well as the world average in moderate or weak transition.

Environmental transition, good performers

The group of good performers comprises 23 countries. The Netherlands is a strong performer in three dimensions, with moderate transition in Emissions reduction. Nine countries are leaders or strong performers in two dimensions. Most of these efforts are related to Emissions reductions and Biodiversity.

Material use is moderate or weak for nearly all countries.

Environmental transition, moderate and weak performers

Two main opposite patterns emerge from the data on the 29 countries that compose the moderate and weak performance groups (the world average is in moderate transition).

One group consists of a large number of countries that despite lagging in their environmental score, demonstrate leadership or strong performance in one or more sub-pillars. This highlights the relative autonomy of the environmental efforts that can be pursued, whatever the socio-economic profile and localisation of a country.

Another group of countries lacking strong points, most of them high-income economies, have with moderate or weak performances in the four sub-pillars (Australia, Canada, Iceland, New Zealand, Russia, Saudi Arabia, South Korea, the United States and the United Arab Emirates at the bottom of the ranking). This shows that environmental performance depends strongly on national policy choices and priorities. In addition, as highlighted by the JRC, the unbalanced profile of these countries makes their ranking in the TPI less robust to changes in pillar weights and other modelling assumptions. The JRC audit mentions, 'when a country shows unbalanced values, it is particularly penalised by the geometric mean', which implies that these countries are rewarded by the choice made to use arithmetic averages, their TPI scores would have been even lower with the choice of aggregating with geometric means.

Indeed, considering the different modelling choices assessed in the JRC audit, the under-performance in the Environmental transition lowers significantly the overall TPI score, as reflected by the confidence intervals of ranks. This is for instance the case for Canada which shows leader or strong performance in all the other pillars and is ranked 44, with a confidence interval of [40, 64], showing that with marginally different, and still sound modelling choices, Canada could have been ranked as low as 64. This kind of unbalanced profile shows the importance of having a holistic approach when looking at transitions.

VI.2. ENVIRONMENTAL TRANSITION, PROGRESS OVER 2011-2020

Over the last decade, **TABLE 12** exhibits progress in Environmental transition for all countries but three:

- The world's (average) progress is high, at 6 %, above the overall TPI progress rate over the last decade. However, there are big disparities in progress. The highest rate is that of Luxemburg (+30.7 %); Croatia, France, Estonia, Israel, Italy, Malta, the Netherlands, the United States and the United Arab Emirates have rates above 15 %.
- Only six countries, all in merely good, moderate or weak transition, see their scores declining over the last decade, in particular Singapore (-13.8 %), followed by Algeria, Iran, Brazil, Georgia and Argentina.
- Compared with starting points, patterns across sub-pillars diverge and require further analysis of country profiles. In particular, best performers in terms of progress belong to all levels of performance groups in the Environmental transition.
- Countries with leader and strong positions in the Environmental transition have a simple average progress rate of 9.5 %.
- Among weak performers, the average progress rate is 6.2 %.

TABLE 12: Environmental transition pillar ranking

COUNTRY		PROGRESS	2020 SCORES				
RANK	NAME	2011-20	ENVIRONMENTAL TRANSITION	Emissions reduction	Biodiversity	Material use	Energy productivity
1	United Kingdom	14.7%	78.0	69.6	86.5	69.6	86.2
2	Malta	15.9%	74.4	77.9	71.3	48.4	100.0
3	Italy	15.5%	73.8	70.0	76.9	69.4	79.1
4	Albania	3.7%	73.3	85.4	77.3	50.1	80.3
5	Denmark	13.9%	73.1	66.3	93.8	39.1	93.1
6	Ireland	12.2%	72.3	46.7	83.2	59.2	100.0
7	Switzerland	6.1%	71.7	74.6	52.3	59.8	100.0
8	Philippines	2.6%	70.3	90.9	53.3	61.6	75.3
9	Colombia	7.1%	69.7	84.6	49.2	54.2	90.9
10	Latvia	1.8%	68.4	74.6	96.2	40.8	61.8
11	Croatia	23.7%	67.6	75.0	82.2	50.8	62.3
12	Morocco	2.9%	67.4	89.1	54.8	53.0	72.5
13	France	15.1%	66.8	71.7	77.2	58.0	60.2
14	Portugal	7.3%	66.4	72.5	70.7	43.8	78.6
15	Hungary	3.2%	66.2	72.1	84.6	50.6	57.8
16	Nigeria	-0.1%	66.1	93.4	77.1	59.0	34.8
17	Greece	12.9%	65.5	65.0	84.8	42.9	69.2
18	Spain	12.2%	65.4	70.4	58.3	59.2	73.7
19	Romania	9.6%	65.3	75.4	73.9	37.5	74.5
20	Germany	11.5%	65.0	57.9	77.6	55.3	69.2
	EU-27	8.6%	65.0	65.0	77.8	48.3	68.9
21	Netherlands	18.0%	64.7	53.8	74.1	65.4	65.8
22	Indonesia	8.4%	64.3	84.9	45.9	54.4	71.8
23	North Macedonia	11.9%	63.3	79.0	66.9	48.2	59.0
24	Algeria	-4.8%	62.6	78.4	64.1	57.0	50.8
25	Tunisia	5.5%	62.1	85.2	52.2	51.4	59.8
26	Mexico	6.3%	61.7	77.6	51.3	53.3	64.9
27	Lithuania	1.9%	61.6	69.2	93.0	21.3	62.9
28	Bulgaria	4.8%	61.2	66.3	95.5	43.9	39.3
29	Egypt	0.9%	61.0	86.1	41.8	55.4	60.5
30	Slovenia	12.7%	60.9	65.8	77.1	45.0	55.5
31	Slovakia	9.7%	60.2	69.2	86.9	29.4	55.2
32	Poland	9.5%	59.7	56.7	88.3	35.4	58.4
33	Belgium	10.7%	59.1	55.8	74.6	55.9	50.2
34	Austria	6.4%	59.1	61.3	70.3	33.8	70.9
35	Czechia	11.7%	59.0	51.3	92.5	45.0	47.1
36	Japan	10.2%	58.8	61.1	54.8	55.9	63.6
37	India	6.6%	58.1	89.6	35.3	53.5	54.1
38	Kenya	2.4%	57.4	93.6	48.1	57.3	30.5
39	Sweden	8.5%	57.0	78.3	66.6	28.0	55.2
40	Thailand	2.6%	56.7	75.0	62.8	42.8	46.2
41	Georgia	-0.5%	56.0	82.4	43.1	54.8	43.7
42	Armenia	2.2%	55.6	86.8	39.8	49.0	46.9
43	Turkey	6.4%	55.6	73.8	19.4	50.2	78.9
44	Norway	13.3%	54.2	59.6	67.2	20.4	69.5
45	Estonia	16.9%	53.9	53.3	93.8	24.5	44.1
	World	6.0%	53.4	70.8	40.2	50.4	52.1
46	Vietnam	1.4%	53.0	83.6	48.9	39.1	40.4
47	Luxembourg	30.7%	52.9	15.4	64.5	47.7	83.8
48	Brazil	-2.2%	52.6	79.5	40.4	35.0	55.7
49	Bosnia and Herzego	0.2%	52.0	65.9	64.5	47.4	30.1
50	Cyprus	7.4%	51.6	53.3	49.3	34.3	69.5
51	Chile	2.1%	51.4	75.6	42.1	33.4	54.7
52	Argentina	-0.5%	51.2	65.7	41.2	43.7	54.2
53	Montenegro	4.0%	49.9	74.8	41.4	28.8	54.5
54	Israel	21.2%	48.9	56.3	17.7	46.2	75.2
55	Finland	11.3%	47.9	57.9	78.1	18.0	37.4
56	Moldova	0.9%	46.8	86.4	18.1	52.8	30.0
57	South Africa	6.8%	46.4	63.0	44.8	49.8	27.9
58	Malaysia	1.1%	46.0	59.5	43.2	30.6	50.8
59	Iran	-4.4%	44.9	57.8	51.5	40.5	29.7
60	Serbia	8.7%	42.8	70.4	25.0	38.0	38.0
61	Ukraine	9.8%	42.7	74.1	34.1	42.5	19.8
62	Singapore	-13.8%	42.2	51.8	21.1	23.9	71.9
63	South Korea	4.1%	37.6	41.5	34.6	36.1	38.4
64	New Zealand	7.9%	36.7	28.6	36.7	33.9	47.5
65	Saudi Arabia	5.5%	36.1	21.1	31.7	50.4	41.4
66	United States	15.6%	36.1	23.3	41.8	34.1	45.3
67	Russia	0.6%	35.5	27.3	39.6	50.8	24.2
68	China	4.0%	34.9	63.9	9.2	28.8	37.7
69	United Arab Emirate	28.3%	31.8	0.0	51.6	25.1	50.7
70	Iceland	2.3%	28.7	34.2	42.0	22.9	15.7
71	Australia	14.3%	28.1	0.0	54.8	11.1	46.5
72	Canada	3.6%	26.4	18.5	37.9	20.5	28.5

Transition leader [75-100] Strong transition [65-75[Good transition [55-65[Moderate transition [45-55[Weak transition [0-45[

Notes: 'Progress 2011-20' refers to the percentage growth of economic transition scores from 2011 to 2020.

Source: European Commission, Transitions Performance Index 2021.

Greenhouse gas emissions

At world level, the score in gross greenhouse gas emissions has been quite stable (+0.6%) over the period 2011-2020, ranked around 33-34, with great disparities among countries. The EU has progressed with 7.6%, meaning that gross greenhouse gas emissions have decreased[67], but it ranks below the world average. Only three EU-27 countries (Hungary, Latvia and Lithuania) have increased their emissions over the decade. Some good progress was made by other countries, for instance Czechia, Denmark, Estonia, Finland, Germany, Greece, Malta and the Netherlands with a progress rate above 10%. According to the European Environment Agency, the EU-27 achieved its climate targets by 2020. However, the 2030 target of a 55% reduction in net GHG emissions can be reached only if additional efforts are made and new policies are adopted and implemented[68]. At country level, only 21 Member States reached their national targets in 2020.

Concerning other countries, the situation is more contrasted. Some countries in leader, strong or good transition, such as Israel, Norway Ukraine and the United Kingdom progressed well with average rates above 10%. Canada, New Zealand and the United States also have showed good progress (above 10%, and 3.7% for the United States), but from low scores, and still in weak transition.

A total of 24 non-EU-27 countries are on a slightly negative trend; of concern is that 14 of these are countries in leader position in that indicator (scores above 75). These are mostly lower middle-income countries, which could lose ground in the TPI if they do not redouble their efforts to bend the curve on GHG emissions.

Two countries (the Australia and the United Arab Emirates) have emissions above the upper limit of the goalpost, meaning that their normalised score for that sub-pillar in the index is 0.

When targeting climate neutrality by 2050, as in the case of the European Green Deal and the Paris Agreement, the net greenhouse emissions might be considered to assess the gap between overall GHG emissions and carbon removals from forests, agricultural practices or engineered solutions. However, due to lack of quality data at the worldwide level, gross greenhouse gas emissions have been taken into account.

Data at EU-27 country level for net greenhouse gas emissions (including LULUCF[69]) can be found at the Eurostat website[70].

Biodiversity

The indicators chosen for Biodiversity show together a global progression over the period 2011-2020 with an average progress rate of 4.5%. However, the indicator on pesticide use per area of cropland shows an increase in the use of pesticides (which is treated negatively in the TPI). Terrestrial and freshwater key biodiversity areas protected both increased.

These results should be contrasted with other indicators and reports on biodiversity[71] and over a longer period of time, which show a general decline in biodiversity in the world. For instance, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) latest Global Assessment, published in 2019, estimated that one million animal and plant species are threatened with extinction worldwide, many of them thought to be insects.

As part of the European Green Deal, the EU's biodiversity strategy for 2030[72] is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. In the post COVID-19 context, the strategy aims to build EU societies' resilience to future threats such as the impacts of climate change – forest fires, food insecurity and disease outbreaks – including by protecting wildlife and fighting illegal wildlife trade.

67 The goalpost for this sub-pillar is a "bad", meaning the higher the indicator is, the lower the score is. Above a certain data, the score would be 0.

68 European Environment Agency, '*EU achieves 20-20-20 climate targets, 55% emissions cut by 2030 reachable with more efforts and policies*', 26 October 2021.

69 Land Use, Land Use Change and Forestry.

70 Eurostat, Greenhouse gas emissions by source sector (source: EEA), online code: SDG_13_10

71 See Brondizio, E. S., Settele, J., Díaz, S., & Ngo, H. T, *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, 2019 and EEA's European environment, State and Outlook 2020

72 European Commission, *Biodiversity strategy for 2030*

Material use

Progress under Material use should be analysed with care as this sub-pillar is composed of two indicators, which are currently not positively correlated, meaning resource productivity and material footprint do not go in the same direction (in terms of normalised scores), even though, as explained at the beginning of the section, they nuance each other to provide a holistic picture of material use that is nuanced from the production and consumption perspectives. Typically, high-income countries performances are stronger for resource productivity and weaker for material footprint. Lower middle-income countries have a better score in material footprint as these countries consume less. Material footprint is therefore an adjustment for the overall material use to reflect better the pressure put on the planet through consumption.

In fact, when looking at the individual progress with each indicator composing the sub-pillar, most countries show a declining trend for material footprint with a global average of -3.8% and a score of 63.3 (good transition) and an EU decline of -7.3% and a score of 41.4 (weak transition). A handful of countries (Saudi Arabia, Greece, and to a minor extent Iran, South Africa, Slovenia and Egypt) made any progress during that period, i.e. decreased their material footprint. Four countries (Australia, Luxemburg, Singapore and the United Arab Emirates), all in the high-income group, have scores of 0 in material footprint for having values above the upper lower bound of 40 tonnes per capita per year (with, respectively, 104, 76, 49 and 43 tonnes per capita of material footprint in 2017, values imputed for years 2018 to 2020).

The UNDP Human Development Report published in 2020 includes the planetary pressures–adjusted Human Development Index (HDI). This index includes two environmental indicators: the material footprint (consumption-based) and CO_2 emissions per capita index (production-based)[73].

Although the planet lacks currently a global boundary framework for material footprint (such the one that exists under the COP for GHG emissions), this adjusted HDI estimates that the maximum sustainable value would be 7.2 tonnes per capita, Currently only 10 countries included in the TPI are within this limit: Nigeria, Kenya, Algeria, Moldova, Morocco, the Philippines, India, Egypt, Indonesia and Tunisia, all achieving leader positions.

On resource productivity, the situation is opposite: most countries progressed during the period 2011-2020. The global progress rate is 23.7% and 11.4% for the EU. All countries in leader, strong or good transition, including the EU-27, had progress above 10%. Overall, 43 countries increased their score by more than 20%, of which ten increased them by more than 50%, showing great global progress at decoupling growth from material use.

At the sub-pillar level of Material use, the world progressed by 4.8% and the EU-27 by 2.5%, with the world score slightly above the EU-27's (50.4 and 48.3 respectively) and great disparities between countries. Fourteen countries show a progress by more than 20%, most of these are EU countries (Belgium, Cyprus, Czechia, Germany, Greece, Ireland, Italy, Luxemburg, the Netherlands, Poland, Spain, and Slovenia). In contrast, 30 countries show a declining trend, including five EU countries (Estonia, Hungary, Latvia, Lithuania and Romania). The biggest decline appears to be in countries already at the bottom of the ranking, in weak transition, China with -11.4%, Lithuania with -23.3% and Norway with -21%. Only exception is Australia, which currently ranks last, and shows a progress rate of 25.7%.

Energy productivity

Energy productivity has a remarkable progress rate of 16.9%, well above the progress rate of the pillar and the overall index. The EU-27 progress rate is 20.1%.

Most countries progressed over the period 2011-2020, except for six countries (Singapore, Brazil, Argentina, Algeria, Georgia and Iran).

Three countries (Ireland, Malta and Switzerland) have the maximum score of 100, performing better than the upper bound of the goalpost, which has been set at a GDP over total energy supply of 20 (2015 PPP$ per kilogram of oil equivalent).

73 UNDP, *Human Development Report 2020*, New York.

VI.3. IMPACT OF COVID-19

The COVID-19 pandemic triggered a 5.4% drop globally in CO_2 emissions in 2020. Unfortunately, these emissions have been rapidly recovering in 2021, in particular due to a rebound in the use of coal and oil.

The impact of the pandemic may be more indirect, with changes in habits induced by confinements. For instance, new working modes, like teleworking, may have a mixed impact on the environment, with fewer emissions from commuting but potentially more from energy use in individual homes and from new working methods linked to digitalisation, depending on several factors.

In addition, the pandemic has accelerated the shift towards a more digital world and has triggered changes in online shopping behaviours that are likely to have lasting effects. However, online shopping and home delivery have been proven to have an increasing negative impact on the environment, not only in terms of carbon emissions due to the transportation of goods, but also in terms of packaging waste, in particular single-use plastic-based packaging.

The COVID-19 pandemic has amplified the change in use-related patterns, boosting the use of digital technologies, which played an essential positive role in coping with the COVID-19 crisis and responsible for direct rebound effects that also have environmental and climate impacts. When evaluating such impact, it is important to account for both not only energy-related issues should be addressed but also impacts in terms of the material use and other impacts linked to mining, or critical raw material extraction and production and disposal of Waste from Electric and Electronic Equipment (WEEE) disposal.