EUROPEAN UNION

Committee of the Regions

An Indicator for Measuring Regional Progress towards the Europe 2020 Targets

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It does not represent the official views of the Committee of the Regions.

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Introduction

The European Semester[1] has gained more and more momentum in strengthening economic and fiscal governance in the European Union. While primarily directed at the national level, it clearly affects decisions and the development on the ground. Achieving the Europe 2020 strategy objectives and developing sound country-specific recommendations strongly depends on the availability of reliable data on which to build adequate policy advice.

The Committee of the Regions (CoR) intends to support and improve participation of local and regional authorities in the planning and implementation of the Europe 2020 Strategy on the ground also by contributing to improving sound statistics and data and by exploring possible new ways of measuring and presenting regional performance. Before adopting the Third Monitoring Report, the CoR was in touch with DG REGIO (Directorate-General for Regional Policy) and Eurostat to receive the most up-to-date statistics. They are included in the Third Monitoring Report on Europe 2020, which states that

"… based on the available data from EUROSTAT, the Committee of the Regions therefore proposes to develop a regional performance indicator, which can provide additional insight into the future potential of local and regional authorities in meeting the targets. The available data could be clustered around the key indicators. The performance indicator would show for each NUTS 2 region, whether it has improved, stagnated or declined in relation to the Europe 2020 objectives. This indicator could also be used to benchmark NUTS 2 regions in Europe and to detect successful regional strategies in promoting growth and competitiveness in Europe."

This report note presents two conceptualizations of a Regional Progress Indicator (called RPI henceforth) for monitoring and assessing progress towards meeting the Europe 2020 objectives. It is based on work carried out by the contractors in collaboration with the Committee of the Regions under the framework contract CdR/ETU/96/2010. It also identifies where additional work may be needed to improve the indicator's methodology or data foundation.

[1] To help achieve the ambitious goals set out in the Europe 2020 Strategy the European Commission has set up a yearly cycle of economic policy coordination called the European Semester. Each year the European Commission undertakes a detailed analysis of EU Member States' programmes of economic and structural reforms and provides them with recommendations for the next 12-18 months. More information is available at http://ec.europa.eu/europe2020/making-it-happen/index_en.htm.

1. Purpose of the Regional Progress Indicator

The purpose of the development of the Regional Progress Indicator (henceforth also referred to RPI for brevity) is outlined in the Third Monitoring Report published by the CoR.[2] Specifically, it is planned to use the RPI to:

- **Track progress at regional level (i.e., primarily NUTS 2 level but where feasible also at NUTS 3 level) with respect to the Europe 2020 objectives.** Since the 27 EU Member States are heterogeneous political entities nationally and sub-nationally with respect to economic, social and environmental characteristics, it is of interest to learn more about sub-national economic and socio-demographic trends and whether the EU can meet its goal become a smarter, more sustainable and more inclusive society at large by learning about the developments at sub-national level and comparing them against appropriate and differentiated benchmarks. (→ see section 1).
- **Compare regional status and trends vis-à-vis the Europe 2020 goals.** While each region is unique, it is still of interest to compare similar regions or leading and lagging regions with one another to learn more about what they have in common or not (→ see section 1).
- **Identify best practices and particularly effective actions and policies.** The implementation of the Europe 2020 goals is taking place in a myriad of ways in the 27 Member States and with the help and under the responsibility of hundreds of regional and local authorities (LRA). The LRAs have an in-depth understanding of the characteristics and needs of their localities and are best suited to develop tailor-made approaches to tackling issues of unemployment, education reform, social cohesion, etc. While it is complicated to associate regionally observed trends (e.g., a decrease in unemployment) with specific policies, actions and regulations put in place by LRAs and/or the national government, it is envisaged that the RPI becomes a useful tool in measuring such developments and helping to identify what actions, policies, etc. are responsible and contributing to this success (→ see section 5).

In light of the persistent challenges with respect to data availability, sub-national target formulation and the measurement of causal effects of policies vis-à-vis the Europe 2020 objectives, the present study focuses on the first two objectives of the RPI.

[2] https://portal.cor.europa.eu/europe2020/news/Pages/3rdCoRMonitoringReportonEurope2020.aspx

2. Choice of Targets and Indicators

2.1 Europe 2020 targets, indicators, and flagship initiatives

The overarching objectives of the Europe 2020 Strategy has been translated into quantitative benchmarks by means of five headline targets and eight headline indicators allocated to them. These EU-level targets have been translated into **individual national targets**[3] (cf. Table 1) by the Member States (albeit not all Member States have specified national targets for all five areas), reflecting more closely and appropriately national conditions and potentials.

Headline Target	EU-wide Indicator and Target	National Targets (Range)
Employment	75% of the 20-64 year-olds to be employed	62.9% - well over 80%
Research and Development	3% of the EU's GDP to be invested in R&D	0.5% - 4%
Climate change and energy sustainability	Greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990	20% increase – 20% decrease compared with 1990
	20% of energy from renewables	10% - 49%
	20% increase in energy efficiency	0.2 – 38.3 Mtoe reduction
Education	Reducing the rates of early school leaving below 10%	4.5% - 29%
	At least 40% of 30-34–year-olds completing third level education	26% - 50%
Fighting poverty and social exclusion	At least 20 million fewer people in or at risk of poverty and social exclusion	Figures cannot be directly compared due to different methodologies

Table 1: List of the Europe 2020 indicators and their EU and national target values and ranges

In order to further support delivery of the headline targets, the Europe 2020 strategy puts forward seven **flagship initiatives** that highlight additional important policy objectives such as youth unemployment, resource efficiency, etc:

[3] See http://ec.europa.eu/europe2020/pdf/targets_en.pdf for a complete list of EU and national targets.

- Innovation Union
- Youth on the move
- Resource-efficient Europe
- Industrial policy for the globalisation era
- Agenda for new skills and jobs
- European Platform against poverty

Each of the flagship initiatives includes a comprehensive package of policy initiatives, which themselves give rise to developing indicators for tracking progress at EU, national and regional/local levels.

2.2 Available options and choices made for the RPI

There are several decisions that need to be made for the Regional Progress Indicator concerning the selection of targets and indicators.

*Concerning **targets**, the options for the RPI are:*

(a) Limit the scope of the RPI to the five Europe 2020 headline targets and associated 8 indicators, or
(b) Expand the scope of the RPI to also take into account additional objectives raised, for instance, in the seven flagship initiatives.

Decision 2: It was decided to focus in the beginning on the "core set" of five targets and eight indicators of the Europe 2020 Strategy while developing the RPI with a view towards future enlargement to include an expanded set of targets that take the six flagship initiatives into account. This decision also takes data availability into consideration, which is already limited in geographical and temporal coverage when only considering the eight Europe 2020 indicators.

2.3 Specification of regional target values

While a clear match of targets and indicators exists at the EU level[4] and in the majority of Member States, the situation is different when it comes to the regional level:

[4] Although some variation exists with respect to the poverty and social exclusion headline target, which is measured by several indicators: at-risk-of-poverty and social exclusion, severe material deprivation, low work intensity households and long-term unemployment.

- Concerning the quantitative targets, there is currently no regional breakdown of the national targets to NUTS 2 or any other sub-national level available.
- Concerning indicators, not all headline indicators have data referring to the regional, in this case NUTS 2, level. Specifically, the following indicators do not have NUTS 2 level data available.
    - GHG emissions,
    - Energy efficiency

Even if the denominators of the national targets are available at regional level, it will still be difficult to allocate the national target to the regions in a way that respects their differences. For example, the tertiary education target cannot be simply broken down according to the share of the population of 30-34 year olds because tertiary education institutions vary in number and density by region as do opportunities to use such a degree for professional and employment purposes in rural versus urban areas. Instead it is much more likely that the distribution of targets from the Member State to the regional level will require more nuanced approaches that take into account extensive information about the regional economy, population size and density, and other factors.

Decision 3: While algorithms can be developed and decisions be made to break the national targets down to the regional level, it was decided that this would be beyond the scope of this project due to the complexities and potential controversies that may arise. The only exception is the distribution of the poverty and social exclusion target to the regional level according to population share. Although this too can be done in different ways, it is believed that an approach based on population shares is reasonably defensible and, moreover, permits the calculation of the progress measure for this indicator.

2.4 Data availability

Aside from completely missing indicators, data availability at NUTS 2 level is very scarce for two other Europe 2020 indicators, namely:

- Share of renewable energies,
- Number of people at risk of poverty and social exclusion, severe material deprivation and persons living in households with very low work intensity.

Table 2 shows the percent of cells in the data matrix with data for each of the relevant Europe 2020 indicators (there are several for the poverty and social exclusion component) for the time period 2000-2012 at NUTS 2 level.

Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GHG emissions	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Share of renewable energy	0%	7%	7%	7%	8%	8%	8%	8%	9%	9%	0%	0%	0%
Early school leavers	71%	79%	85%	74%	74%	85%	85%	90%	89%	92%	94%	93%	92%
Tertiary educational attainment	85%	86%	88%	90%	90%	90%	90%	92%	92%	96%	96%	96%	96%
Employment rate	0%	90%	91%	91%	91%	91%	91%	94%	94%	100%	100%	100%	100%
R&D spending	38%	40%	48%	69%	48%	74%	52%	78%	57%	87%	37%	2%	0%
Poverty and social exclusion	0%	0%	0%	1%	15%	41%	51%	56%	63%	63%	54%	38%	4%
Energy efficiency	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 2: Data availability for each of the Europe 2020 indicators at NUTS 2 level.

As the table above demonstrates, data availability is generally increasing over time. It is highest for employment rate of 20-64 year olds, the percent of 30-34 year olds with tertiary degrees and the school dropout rate. At the same time, data availability remains low for renewable energy. GHG and energy efficiency data are still missing entirely.

In addition, the poverty and social exclusion indicator is weakly defined and measured in the sense that

(a) it encompasses multiple aspects of poverty, which are expressed through several indicators (at-risk-of-poverty and social exclusion, very low work intensity, severe material deprivation and long-term unemployment),
(b) progress is measured in terms of the change in the absolute number of people whose livelihoods are improved, which requires the conversion of poverty rates etc. to population data and the calculation of change compared to a baseline year, and
(c) the methodologies and definitions that are used nationally vary across Member States, which makes comparisons more difficult and requires additional calculations.

The data situation prompted an investigation into the possibility to disaggregate data only available at NUTS 0 or 1 level to NUTS 2 level. With respect to the NUTS 1 level, it was found that data are available as shown in the next table (Table 3).

Indicator	Eurostat code	Time	NUTS
Persons aged 30-34 with tertiary education attainment by sex	edat_lfse_12	2000-2012	NUTS 1
Early leavers from school and training by sex and NUTS region	edat_lfse_16	2000-2012	NUTS 1
Total intramural R&D expenditures (GERD) by sectors of performance	rd_e_gerdreg	2000-2011	NUTS 1
Employment rates by sex, age and NUTS region (%)	lfst_r_lfe2emprt	2000-2012	NUTS 1
People at risk of poverty and social exclusion by NUTS region	ilc_peps11	2004-2011	NUTS 1
Severe material deprivation rate by region	ilc_mddd21	2003-2011	NUTS 1
People living in households with very low work intensity by NUTS region	ilc_lvhl21	2004-2011	NUTS 1
At-risk-of-poverty rate by NUTS region	ilc_li41	2003-2011	NUTS 1

Table 3: Data availability for the eight Europe 2020 headline indicators at NUTS 1 level.

While data on early school leavers are available at NUTS 1 level, the indicators GHG emissions and renewable energy are still missing at NUTS 1 level, which leaves only national-level data to break down and allocate to the NUTS 2 regions according to a pre-specified algorithm. Data completeness for the other indicators also varies at NUTS 1 level, which further hampers their use in breaking them down to NUTS 2 level.

The timeliness of the available NUTS 1 data is a bit better than for NUTS 2 data, especially for tertiary education and employment rates. So this would open the possibility to use NUTS 1 level data to project at NUTS 2 level and therefore make the NUTS 2 calculations a bit timelier. In light of the economic crisis this could be advantageous as decision-makers would be able to base their decisions on somewhat more recent regional information than what the raw NUTS 2 data would permit. However, projections always carry a measure of uncertainty with them, which also tend to be higher in periods where the modeled system is disturbed by shocks such as the economic crisis. This additional level of uncertainty needs to be balanced against the perceived advantages of producing more recent data.

Decision 4: It was decided that during this project focus will be put on a so-called "core" version of the RPI referring to item (a) mentioned above concerning the selection of targets and indicators, i.e. this RPI will have a scope limited to the Europe 2020 headline targets and indicators listed in section 2

above. A disaggregation of targets/data not available at the regional level will not be applied. The RPI will therefore be split into:

- a National Progress Indicator (NPI), which provides a national aspect (looking at the **progress at the level of Member States towards the quantified headline targets**) and
- a Regional Progress Indicator (RPI) that offers a – more limited - regional perspective by looking at the **status and trends of the available NUTS 2 data** for the headline indicators.

Decision 5: Should the RPI be developed further in the future, it might be possible to apply approaches that combine the observed data with statistically derived estimates (gap filling and forecasting) as well as complement the RPI with additional indicators for additional context and depth. Such an enhanced version of the RPI may also attempt to develop a robust and acceptable approach for disaggregating the national targets and indicator data at NUTS 0 and 1 levels to the NUTS 2 level.

3. Measuring progress

3.1 Distance to target path

Since the specified targets are set to be achieved by 2020 there is a timeline involved during which the countries/regions should be moving toward the final target value, i.e., the value that is supposed to be reached by 2020. The conceptual development of the NPI and RPI should therefore evaluate the choice between time-dependent targets (i.e., the adjustment of the 2020 target to time points between 2010 and 2020) and static targets (i.e., using the 2020 target as the only evaluation benchmark.

If the target is held constant at the value (see red line in Figure 1 for a national target of 75% of 20-64 year olds being in work) that is to be achieved by 2020, then the evaluation of progress towards the target involves comparing the country's/region's current indicator value with that of the target. If the country/region has already met the target, the task would be to maintain or even further improve this indicator until 2020. However, in the case that the country/region has not yet reached the target, it cannot be determined if the country/region is making sufficient progress to keep it on a feasible path towards success in 2020.

Time-adjusted targets as shown by the green line in Figure 1 can help address this issue. However, doing so requires the specification of the time-path for each of the eight Europe 2020 indicators (and for any additional indicators that might be included in the future). The following aspects should be considered:

- Start with each country's/region's baseline value at the beginning of the reporting period (in Figure 1 this is set to 2008 but other start years are possible).
- Specify a realistic or planned path of improvement for the indicator of interest, e.g., a linear monotone path, a path based on a fixed annual growth rate, or a path assuming an accelerating/decreasing growth rate.
- Take into account any knowledge of events between the start of the assessment period and 2020 that will impact the indicator's path (e.g., end of an investment cycle in a given year that will slow down improvement in the indicator temporarily or permanently).

The more realistically the time-dependent target path can be specified, the more accurately it can be predicted if the country (or region) is on track to achieving the 2020 goal.

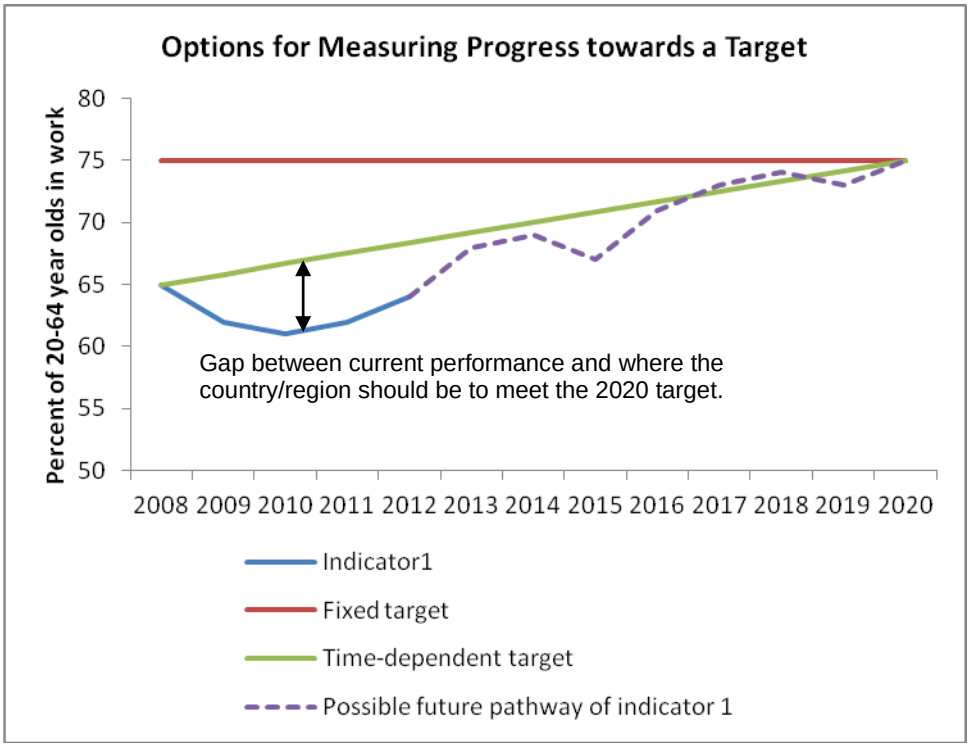


Figure 1: Options for assessing progress for an indicator (blue line) towards a target over time: (a) the current indicator value is compared to the fixed 2020 target shown by the red line and (b) the current indicator value is compared to a trajectory (green line) that the indicator should follow to reach the 2020 target in 2020.

To measure progress towards achieving the Europe 2020 targets, a simple calculation of the distance between the actual indicator value and the time-dependent target path is a meaningful metric. It shows if the country or region should increase its efforts to improve the indicator or if it is well on track to meeting (or exceeding) it.

Decision 6: For the first NPI and RPI it was decided to apply a static target. While it does not allow the evaluation whether a region or country is following a prescribed path to the 2020 target, it facilitates data exploration, which is an important part of the focus at the beginning of the development process of the composite indicator. As more understanding of the regional variations and the drivers behind the Europe 2020 indicators emerges, it might become feasible to specify time-dependent targets in order to assess interim progress to the 2020 targets.

3.2 Change over a period of time

Since the Europe 2020 targets have been translated to the national levels only, the distance to target approach described above is not easily applied to measuring progress at the regional level. The most feasible alternative here would be to look at the status and the rate of change of the indicators available at NUTS 2 level:

- **Status** means the indicator value in the most recent year for which data are available.
- **Rate of change** refers to the change in the values of the indicator over a certain period of time. The rate of change can be expressed in absolute terms (e.g., number of persons removed from being considered at risk of poverty or social exclusion) or in relative terms (e.g., percentage change in the increase of energy efficiency), for the whole reference period or on a per year basis (e.g., year-over-year rate of growth). The latter facilitates comparisons between regions because the result is (more or less) independent of the length of the time series (disruptions in the time series such as have been caused by the recent crisis do of course influence the resulting figures).

For both approaches (sections 3.1 and 3.2), it is important to highlight in this context that the **choice of base year**, i.e., the year against which current progress can be assessed retrospectively, is important due to the impacts of the economic crisis. The in many cases considerable economic, social and even environmental effects of the crisis mean that base years prior to 2008-2010[5] will make progress on many indicators appear to be negative or stagnating; while choosing 2009 or 2010 might make look the current improvements look overly positive.
It might therefore make sense to **distinguish between short-term progress since 2009 and long-term progress since 2000 or 2007** (i.e., before the crisis).
Decision 7: In addition to reporting and comparing the current state of progress made by the NUTS 2 regions and EU Member States vis-à-vis the Europe 2020 targets, the study also considers the trend and rate of change observed in each location.

[5] Depending on the thematic orientation of the indicator (economic, social, environmental), the time-lag for the impact of the crisis to be visible may vary (i.e. while some indicators such as energy consumption show a rather immediate impact of the crisis, others such as long-term employment will only be influenced with a time-lag of 1-2 years).

4. Comparing Regions

Indicators are often used to make comparisons across the units being evaluated (e.g., countries, regions, counties, cities). For the RPI it would be of interest to identify the regions that are progressing the most/least (in absolute and relative terms) or are improving/deteriorating the fastest (rate of change).

These assessments can be made in a number of ways, including a distance-to-target approach or by ranking regions according to their performance in a given time period. A challenge is the use of differentiated national (and regional) targets, which means that the distance-to-target calculations are not directly comparable because they are adjusted to national contexts.

Using rankings implies that regions are compared as if they were homogeneous, which is of course also not the case.

4.1 Weighting and Aggregation

An added decision to be made in the development of a composite indicator such as the RPI involves the choice of weights for the indicators and the aggregation formula. This decision is not trivial and usually requires balancing opposing objectives such as choosing an approach that is intuitive and easy to communicate versus an approach that respects national or regional contexts or relies on more complicated mathematical/statistical concepts. A simple example of the potential pitfalls in the choice of weights is shown in Figure 2.

Decision 8: The potential value of the RPI is considered to be both the transparent and clearly arranged status and trends of the regions and Member States vis-à-vis the eight Europe 2020 indicators and the calculation of an aggregate measure of performance at national and possibly regional levels. It is therefore decided to use a simple, equally weighted average for the distance-to-target indicators at national level and a matrix approach showing the current value and year-over-year change for the indicators at regional level. The latter can then be aggregated, for example, by summing the number of indicators with positive trends, negative trends, and stagnating trends, respectively.

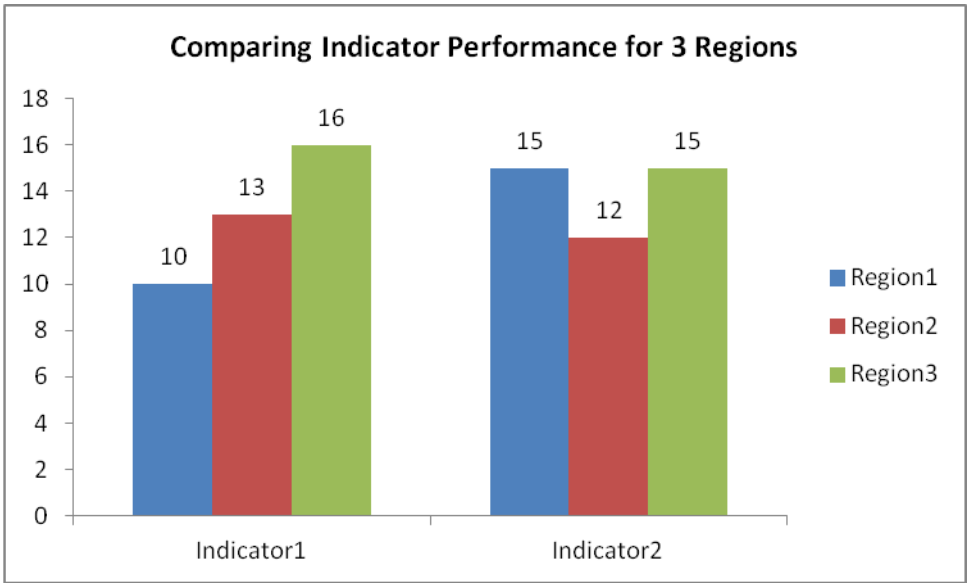


Figure 2: Options for comparing the performance of three regions. Region 3 outperforms the other two on both indicators, so its first rank is independent of the choice of weights for indicators 1 and 2. Not so for regions 1 and 2: Region 1 performs better than region 2 on the second indicator but not the first. However, depending on the weighting, region 1 could or could not outperform region 2 in aggregate performance.

5. Identifying Best Practices

The third aims of the RPI (see section 1) is to allow the users to **link good performance on a given indicator or indicator set back to actions and policies the region (or Member State)** has put in place. As stated previously, this is a challenging task because it involves (i) knowing in detail the actions and policies put into place in a given region or country, (ii) having a theoretically founded and empirically supported explanation of how they influence the indicator(s) of interest and (iii) the ability to establish the empirical causal effect or at least an association between them.

Although it was decided to focus on the first two objectives for the PRI, it is noted that the surveys that the CoR has and is conducting to evaluate the value added brought about by the Europe 2020 flagship initiative provide an additional source of information on the policies and actions related to the Europe 2020 indicators. Using this information, actions taken by local and regional authorities or the national government to achieve the Strategy's objectives could be evaluated, however, establishing clear causality will remain challenging for a number of reasons.

In principle, there are two approaches for identifying best practices:

(a) In a **policy-oriented approach**, the objective would be to review policies and actions on a case study basis to see when they were put in place and whether there was a response in the associated indicator(s) after allowing for an adequate time lag (e.g., a job training programme could be expected to help a higher number of unemployed people find jobs 0-6 months after completing the programme).

(b) In a **data-oriented approach**, one would first identify the regions with the best performance (in a specific policy area) vis-à-vis regions that have remained rather stable or where the situation has worsened, and then investigate which policies and actions the "successful" regions have implemented that are absent in the other cases.

However, due to the theoretical and practical challenges mentioned above, the identification of best practices will not be in the focus of this study.

6. Learning from other Progress Indicators

Before proposing concrete concepts for the RPI it is also helpful to review existing indices of regional economic, social and/or environmental performance. The following sections describe a small number of relevant indices. Relevant considerations in the development are then used in the conceptual design of the RPI.

6.1 Lisbon Regional Indicator

The Lisbon Index[6] was developed by the Directorate General for Regional Policy (DG Regio) to measure how far regions are from eight Lisbon targets. A region scores 100 if it has reached all eight targets (see Table 1), while the region farthest away from all eight targets scores 0. The index was used to determine the leading and lagging regions, the fastest improvers and developments for the EU27 as a whole as well as in regions categorized into Convergence regions, Transitions regions and RCE regions.

The Lisbon Index improved upon the methodologies used in other Lisbon indicators, such as those published by ESPON, the Lisbon Monitoring Platform, the Lisbon Council and in the 4th Cohesion Report.[7] One of the problems with some of the other Lisbon indicators is that certain indicators overlap and are therefore counted multiple times. The Lisbon Regional Indicator methodology had four goals:

1. To take into account the Lisbon targets in a manner that would be easy to understand;
2. To ensure that the same value receives the same score each year;
3. To avoid double or even triple counting;
4. To combine the individual indicators in such a way that the same change receives the same weight across related indicators.

The resulting index used a distance-to-target approach (in this case using a ratio transformation) that expressed the difference between the current indicator value and the Lisbon target as a ratio between 0 (region farthest away from target) and 100 (regions that have reached or exceeded the target).

[6] More information available at http://ec.europa.eu/regional_policy/sources/docgener/focus/2010_03_lisbon_index.pdf

[7] See http://ec.europa.eu/regional_policy/sources/docgener/focus/2010_03_lisbon_index.pdf for more information.

The second goal was reached by fixing the maximum distance from the target. Outliers were removed to avoid distortions to the distribution of the indicator values and double counting was avoiding by only including distinct indicators in the index.

The fourth goal was achieved by adjusting the possible minimum values of the indicators in such a way that an increase of 1 percentage point always leads to the same increase in the Lisbon Index.

6.2 JRC Regional Competitiveness Indicator

The Regional Competitiveness Indicator[8] was developed by the JRC's Institute for the Protection and Security of the Citizen (IPSC), DG REGIO to improve the understanding of competitiveness at the regional level. It covers the 271 EU NUTS 2 regions and relies on data from Eurostat complemented by data from the OECD, the European Cluster Observatory, the World Bank Governance Indicators and the Ease of Doing Business Index. The most recent data have been used for all indicators, with a temporal range for most indicators between 2007 and 2009.

The Regional Competitiveness Indicator demonstrates the strengths and weaknesses of each of the 271 EU regions (NUTS 2 level). It incorporates a wide range of issues related to competitiveness including innovation, quality of institutions, infrastructure (including digital networks) and measures of health and human capital, and will be a crucial tool in assisting EU regions to set the right priorities to further increase their competitiveness.

The index measures the competitiveness of a region, including factors related to innovation and technological capabilities, to transport and communication infrastructure, health, education policies and quality of institutions. The index is composed of 11 pillars divided into three groups:

- The basic pillars represent the basic drivers of all economies. They include (1) Quality of Institutions, (2) Macro-economic Stability, (3) Infrastructure, (4) Health, and the (5) Quality of Primary and Secondary Education. These pillars are most important for less developed regions.
- The efficiency pillars are (6) Higher Education and Lifelong Learning, (7) Labour Market Efficiency, and (8) Market Size.

[8] More information available at http://ec.europa.eu/dgs/jrc/index.cfm?id=1410&obj_id=11500&dt_code=NWS&lang=nl

- The innovation pillars, which are particularly important for the most advanced regional economies, include (9) Technological Readiness, (10) Business Sophistication, and (11) Innovation. This pillar group is more important for intermediate and, most especially, highly developed regions.

These pillars aim to measure the different dimensions of competitiveness. They are designed to capture the short- as well as long-term capabilities of the region.

The weights of the 3 pillar groups are adjusted according to the level of development of each region defined by its GDP per capita and are tested using robustness analysis.

6.3 Regional Innovation Scoreboard

The Regional Innovation Scoreboard[9] has been developed by DG Enterprise to perform a comparative assessment of how European regions perform with regard to innovation. It covers 190 regions across the European Union, Croatia, Norway and Switzerland.

The Regional Innovation Scoreboard is based on the methodology of the Innovation Union Scoreboard and is accompanied by the Regional Innovation Scoreboard 2012 Methodology report.

The Regional Innovation Scoreboard 2012 classifies the European regions into four innovation performance groups, similarly to the Innovation Union Scoreboard. There are 41 regions in the first group of "innovation leaders", 58 regions belong to the second group of "innovation followers", 39 regions are "moderate innovators", and 52 regions are in the fourth group of "modest innovators".

6.4 SIESTA - Spatial indicators for a Europe 2020 Strategy Territorial Analysis

The aim of this project was to provide evidence on the territorial dimension of the EU2020 Strategy by identifying opportunities for different types of regions in relation to the targets and flagship initiatives set out in the Strategy. The results of this ESPON project titled “SIESTA – Spatial Indicators for a Europe 2020 Strategy Territorial Analysis” are intended to be useful for policy makers at various scales in the process of identifying territorial interventions, for

[9] More information available at http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/index_en.htm

example at the scale of regions and local authorities and in the preparation of regional development strategies. The findings of this project furthermore will enable policymakers to have more in-depth monitoring and steering of the implementation of the strategy.

Carried out under the leadership of the University of Santiago de Compostela, Spain, the project examined the following policy questions:

- What is the territorial dimension of the Europe 2020 Strategy?
- Which types of regions have what opportunities to reach the targets set and contribute to smart, sustainable and inclusive growth?
- What specific levers for development regions have in order to support the three pillars related to the EU2020 Strategy? And how can these opportunities and potentials can be more efficiently exploited?
- What is the current position (possible by using a ratio transformation) and recent trends of the European regions/cities in relation to the targets mentioned in the Europe 2020 Strategy?
- What opportunities and challenges do the European regions/cities have to support the various policy targets of the Strategy?

Among the outputs of the project are a database of regional statistics and an atlas of spatial maps.

The ESPON 2013 Database provides fundamental regional information provided by ESPON projects and EUROSTAT. This information can be used to support territorial development analysis at different geographical levels. The Database aims to contribute to a better understanding of the potentials and development perspectives of regions in the European context and globalised world.

The ESPON Atlas provides a synoptic and comprehensive overview of findings from ESPON Projects of the 2006 Programme. The results have been compiled thematically and arranged in the form of synthesis maps which combine results of different projects. These synthetic maps are prefaced by original project maps to provide users with more in-depth background information. The Atlas is complementary to other ESPON reports. Together they provide new insights into European territorial trends, perspectives and policy impacts. In particular the Atlas has been designed to accompany the final ESPON Synthesis Report III by deepening the thematic and project related information provided giving more space to visual presentations of project results. The ESPON Atlas is based on information provided by all ESPON projects.

The approach and findings of this project, which concluded in April 2013, are highly relevant for the work on the RPI and can support its future development.

7. Conceptual Framework for the Europe 2020 Progress Indicator

The previous sections presented the main choices that present themselves in the development of the progress indicator and the decisions that have already been taken. Building on these choices and decisions and taking into account the experiences of existing regional composite indicators, two design concepts have been developed. The first is a pilot regional progress indicator (RPI) for the NUTS 2 administrative level that is based on a limited set of six Europe 2020 headline indicators and the second is a national progress indicator (NPI) that uses the full set of eight Europe 2020 headline indicators.

The RPI is a pilot exercise from a conceptual development perspective and because the data for evaluating the regional implementation and progress of the Europe 2020 Strategy are by and large not yet available. The results presented in this report refer to the period 2000-2012 except when noted otherwise due to more limited data availability. The following sections describe how both composite indicators have been calculated.

7.1 Distance-to-target approach at national level

Since the Europe 2020 strategy has identified indicator-specific targets at both EU and national level, the distance-to-target approach was found to be an appropriate tool to evaluate progress towards the strategy's objectives.
The national targets – as far as available – were used for both the NPI and the RPI. If regional targets were to become available (e.g., as a result of the Europe 2020 strategy's forthcoming mid-term assessment), they can be used to better reflect the regional circumstances and to assess regional progress with regard to them.

If a Member State has not set a national target for a given indicator, the distance to target value for this indicator was not calculated.

The distance-to-target (DTT) value for an indicator is expressed as the difference between the current (most recent available value) and the target divided by the target value and multiplied by 100 such that the resulting value would generally fall between 0 and 100. However, there are two exceptions to this rule. The first exception concerns countries or regions that have already exceeded their target values for a given indicator. In this case the DTT value also exceeds 100. The second case concerns indicators for which the country or

region has moved farther away from the target, for example for the poverty indicator. In this case, the DTT value can slide into the negative territory.

There context in which it can be justified to allow the DTT values to exceed the boundaries of 0 and 100, for example, when the target is an interim goal and further progress is envisioned or if penalties should be applied for moving away from the target instead of progressing towards it.

For the NPI and RPI it was decided to truncate those DTT values that fell outside of the 0 to 100 interval and to set these values to 0 and 100, respectively. The reason for this decision was to retain the intuitive interpretation of the basic DTT concept as a signal of the portion of the way that a country or region has already covered towards meeting a set target. Thus, lack of any progress by a region or country (or even negative progress) on a given indicator is equated with a zero value and reaching the target (or even exceeding it) is equated with having passed the finish line and obtaining a score of 100.

After calculating the individual DTT values, the final composite indicator score for the NPI was determined as the arithmetic average of the DTT values. If a country or region is missing one or more DTT values, the score is calculated as the average of the available DTT values, i.e., no assumptions, substitutions or penalties are used to replace a missing indicator's DTT value. This concerns in particular the United Kingdom, which has only set quantitative targets for the GHG emissions and renewable energy indicators.

Since the Europe 2020 process has not specified regional targets, the pilot assessment of regional progress is based on an evaluation of the current indicator values, their DTT values as well as their trends over time.

The aggregated composite indicator scores for the NPI and the individual DTT values for the RPI then allow the user to:

- Evaluate how countries or regions compare with respect to their aggregated progress toward the Europe 2020 targets;
- Analyse if a country or region is on track to meeting its target for a given indicator;
- Determine for how many indicators a country or region is on track/not on track to meeting their targets;
- Calculate how many countries or regions are on track to meeting their targets for a given indicator;
- Discuss if the EU as a whole is likely/unlikely to achieve the goals of the Europe 2020 Strategy;

- Identify which countries or regions are leaders or laggards with respect to both the progress made and the level of ambition expressed in their individual targets;
- Determine how fast a region is improving or deteriorating compared to the previous year or the base year;
- Compare status and trends in similar regions using auxiliary data characterizing the regions (e.g., urban-rural continuum, per capita GDP, coastal and mountainous regions);
- Pursue additional avenues for further research into best practices, effective/ineffective policies, etc.

The trend evaluation of the regional indicators uses a matrix-based approach, which is characterized by a high degree of transparency and richness of information. This allows the users to develop additional metrics or comparisons. The matrix is illustrated in Figure 3.

Indicator	Region 1				Region 2	…	Thematic Score (counts of improving, stagnating,
	Current value	Trend	Target	Distance to target	Current value	…	
Employment							
75% employment rate							
R&D							
3% of GDP in R&D							
Climate Change and							
20% reduction in GHG							
20% share in renewable							
20% increase in energy							
Education							
Maximum 10% school							
40% of 30-34 year olds							
Poverty and Social							
20 million fewer people at risk of poverty or social							
Experimental Regional							
Improving trend							
Stagnating trend							
Deteriorating trend							

Figure 3: Schema for the proposed structure of the regional performance assessment matrix. The indicator targets shown are the Europe 2020 values. The evaluation of regional performance only considers the change compared to the baseline year and the previous year.

8. Data

The primary data source for the study is the data and statistics portal of the European Statistical Office (Eurostat). It provides quality-controlled and documented data on the Europe 2020 indicators at national and regional levels to the extent that the respective indicators are part of the statistical data collection system. The data have been assembled in two databases. The first is at the Member State level (NUTS 0) and the second at regional level (NUTS 2). Data availability at NUTS 1 and 3 levels was also considered but NUTS 2 was found to provide the best balance between the size of political units and data availability.

Additional data, such as labour force participation and regional GDP, are available from Eurostat and other sources, for example, the OECD regional eXplorer database and visualization tool. They can be used to put the NPI and RPI results into more detailed context and to perform analyses regarding the drivers of positive progress in individual countries or regions.

8.1 Gap Filling

Since some regions and indicators do not have complete data coverage for the test period 2000-2011, gap filling procedures could be employed to improve data coverage. They can involve simple to complex statistical methods and although the properties of more sophisticated statistical imputation methods such as multiple imputation are well understood and generally beneficial, their technical flavor has often prevented their use in conjunction with official data. For this reason, it is decided that for now, data gaps are not filled but this can be tested in the future.

Another important limitation of the RPI compared to the NPI is the relatively large time lag, often amounting to 2-4 years between release of the data and the time period covered by the data. In order to evaluate the progress of the regions with respect to the Europe 2020 indicators on a timely basis, more recent information is required. This can be done through various mathematical and statistical methods that, for example, extrapolate the previous trajectory or – in case of highly volatile indicators or recent events that make it unlikely that the indicator will follow its past trajectory – use proxy indicators with more recent coverage (see Figure 4) that are known to be well-correlated with the indicator of interest.

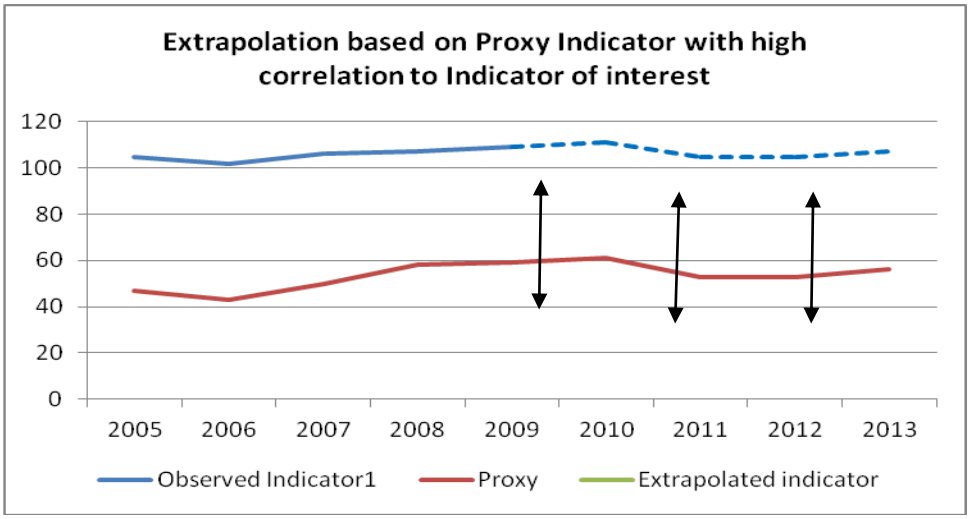


Figure 4: Example of how a regional indicator with a four-year time lag can be extrapolated using a proxy indicator with more recent data coverage and strong correlation.

8.2 Baseline Year

The GHG emissions indicator, energy efficiency indicator and the poverty and social exclusion indicator are measured as change compared to a baseline value. For example, at EU level, the GHG emissions indicator's target is a 20% reduction in emissions compared with 1990 by 2020, energy efficiency is targeted to be 20% higher than in 1990 as measured by the change in energy consumption (equivalent to a reduction in consumption of 368 million tonnes oil equivalents) and the number of people at risk of poverty and social exclusion is to be reduced by 20 million between 2010 and 2020. The GHG emissions indicator is already indexed to 1990 and progress in emissions reductions can therefore be easily evaluated. For the other indicators the baseline year was chosen according to data availability and progress was measured as the change from the selected baseline year to the most recent available year (MRYA).

It is indicated in the indicators' databases, which year was selected as baselines and a summary is given in the table below (Table 4). As more data becomes available, these calculations can be updated to reflect as much as possible the specific baseline and current time periods.

Indicator	Data coverage at NUTS0 level regarding baseline and evaluation time points	Data coverage at NUTS2 level regarding baseline and evaluation time points
GHG emissions	Complete coverage for EU27 up to 2011. This indicator is already indexed to the baseline year of 1990, so that current index values show the percentage level of current emissions compared with 1990 emissions (e.g., 83% in EU27 in 2011)	This indicator is not currently available at NUTS2 level.
Energy efficiency	Baseline year is 2000 and evaluation year is 2010 for all EU27 countries.	This indicator is not currently available at NUTS2 level.
Poverty and social exclusion	Baseline years set to 2005 with exception of Bulgaria and Romania, for which it is 2006, due to lack of sufficient data. MRYA is 2011 except for Czech Republic, Latvia, Hungary and Finland, for which it is 2012.	Baseline year selected is 2008 due to data availability. MRYA is 2009-2012 depending on data availability.

Table 4: Summary of baseline and evaluation time periods for the Europe 2020 indicators GHG emissions, energy efficiency as well as poverty and social exclusion

9. Results

9.1 National Progress Indicator (NPI)

The NPI is shown in Figure 5 in order of smallest DTT value to largest, i.e., least progress to most progress. It shows that six countries – Czech Republic, Denmark, Netherlands, Lithuania, Sweden and Estonia – have on average achieved at least 80% of the path to the 2020 targets. At the bottom are Spain, Ireland, Malta, Portugal, Cyprus and Greece, which all have scores of less than 60%. The EU27 as a whole averages just over 60% of the distance to the targets.

This result would change if different weightings were applied to the indicators and should, therefore, be only one of several ways to analyse the progress made at Member State level towards the Europe 2020 goals.

It also noted that the UK has only specified targets for GHG emission reductions and renewable energy. Its NPI is therefore only the average of the two corresponding distances to their corresponding target values. A few other countries also do not have targets for specific indicators, so that their NPI values represent a smaller number of total indicators, but not to the same extent as the UK.

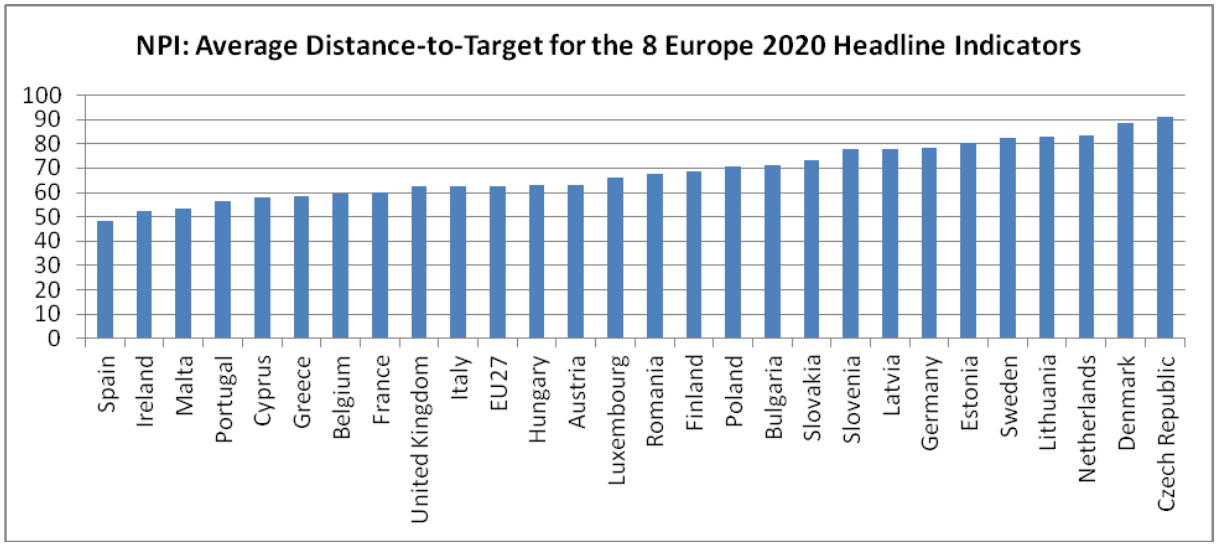


Figure 5: The National Progress Indicator for the 27 EU Member States and the EU27 sorted from country with the smallest progress to country with the most progress

Figure 5 also masks many and interesting differences at the indicator level as shown in Table 5 and Figure 6. The Europe 2020 Strategy consists of three dimensions: innovation, social inclusion and sustainability. It is thus also of interest to look at the progress on each of these dimensions.

Table 5 shows the degree to which the Member States and the EU27 have already achieved the specified targets in each of the three dimensions of the strategy. Green indicates that on average at least 75% of the targets have been reached, orange corresponds to 50-75% and red indicates less than 50% progress towards the targets.

The sustainability pillar consists of the indicators GHG emissions, energy efficiency and the share of renewable energy. The smart growth score includes tertiary educational attainment and investment in R&D spending. The poverty and social pillar incorporates the early school leavers, employment rate and poverty and social exclusion indicators. The vast majority of countries – and hence the EU27 as a whole – are lagging on the sustainability metrics while more than half of all countries are showing positive developments in the smart growth sector.

Using the 2000-2012 data, it is found that progress to date has largely been concentrated in the innovation sector and the social inclusion dimension. Most countries score poorly on the sustainability dimension because of slow progress in increasing energy efficiency and growing the share of renewable energy.

Country	Average Sustainability Score	Average Smart Growth Score	Average Social Inclusion Score
Spain	45.01	67.73	41.71
Ireland	36.53	85.17	54.64
Malta	19.98	83.94	55.96
Portugal	55.77	61.59	46.67
Cyprus	28.77	98.00	62.00
Greece	50.09	96.56	59.68
Belgium	43.80	80.70	61.57
France	48.88	80.93	55.03
United Kingdom	62.67	NA	NA
Italy	54.39	82.58	55.38
EU27	53.74	78.58	60.62
Hungary	56.67	82.95	61.23
Austria	55.27	71.17	56.40
Luxembourg	33.70	81.09	100.00
Romania	66.27	53.32	75.89
Finland	57.14	97.25	62.92
Poland	56.44	65.80	86.74
Bulgaria	62.65	56.36	87.03
Slovakia	56.43	63.63	86.42
Slovenia	86.70	90.17	66.00
Latvia	60.92	73.33	100.00
Germany	61.39	85.31	84.95
Estonia	66.67	88.54	93.61
Sweden	63.95	92.13	100.00
Lithuania	72.93	74.21	100.00
Netherlands	59.01	90.80	96.20
Denmark	75.18	100.00	100.00
Czech Republic	86.15	80.00	93.33

Table 5: Progress made by the EU27 and the Member States along the three dimensions of the Europe 2020 Strategy: smart, sustainable and inclusive growth.

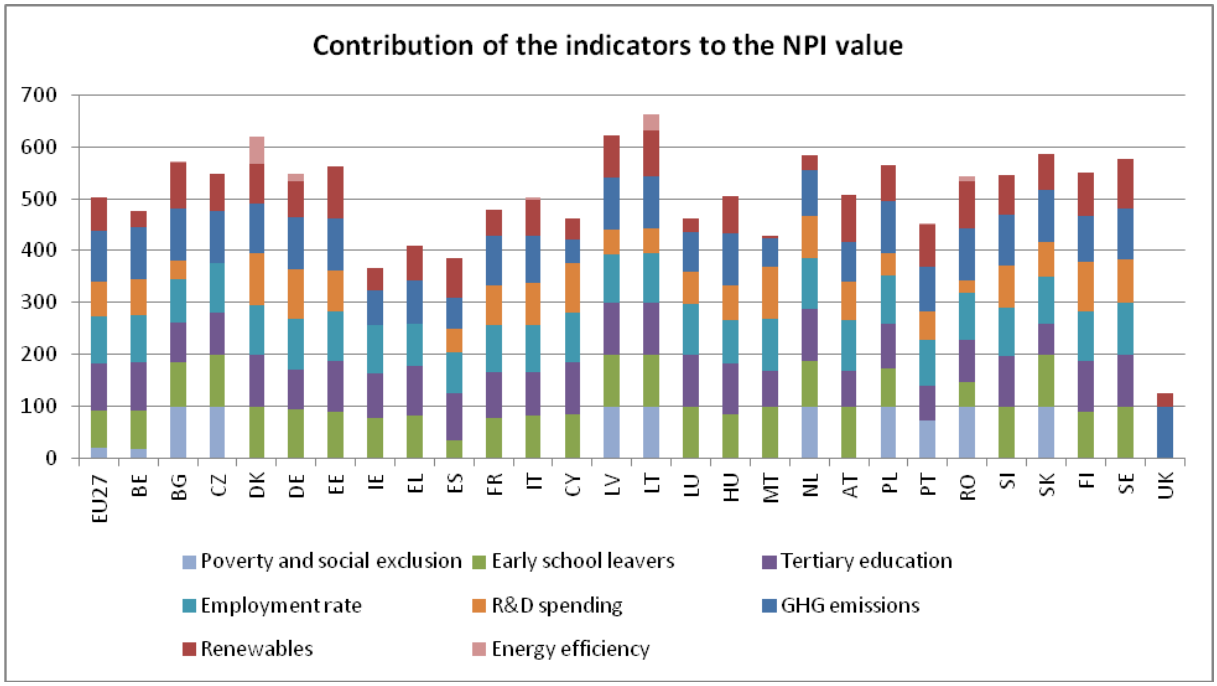


Figure 6: Progress on the individual Europe 2020 indicators at the EU27 and Member State level.

Drilling down even further to the indicator level as shown in Figure 6 helps identify the specific areas where countries need to invest more effort to get on track to achieve their commitments under the strategy.

The chart shows that the energy efficiency and poverty indicators are contributing the least to countries' NPI scores. The employment rate, GHG emissions and tertiary degree indicators have shown the most progress for the majority of countries. The UK is missing targets for all but the GHG emissions and renewable energy indicators and therefore has the lowest cumulative score.

Figure 6 is not prescriptive in terms of successful or failing policies, but serves as means to summarize and visualize the information on the Europe 2020 indicators and to identify, which countries or indicators should be examined in more detail to learn why some countries are making significant progress and can be used as models to develop and evaluate more effective policies.

Table 6 shows for each country, how many of the Europe 2020 indicators are showing significant positive or negative trends or have an undeterminable trend for three different assessment periods. The first period generally starts in 2000 and ends just before the financial and economic crises started, while the second and third show progress since the onset of the dual crises (2007 – MRYA) and after their worst effects had waned (2009 – MRYA). In determining when a trend was significant the definition of Eurostat was applied, which considers the

trend to be significantly positive or negative, if the annualized growth rate is larger than 1 or less than -1, respectively.[10]

	Pre-crisis			Crisis onset			Recovery		
Country	**Indicators with positive trend**	**Indicators with neutral trend**	**Indicators with negative trend**	**Indicators with positive trend**	**Indicators with neutral trend**	**Indicators with negative trend**	**Indicators with positive trend**	**Indicators with neutral trend**	**Indicators with negative trend**
Austria	3	5	1	5	4	0	3	5	1
Belgium	5	4	0	4	5	0	2	4	3
Bulgaria	2	1	6	7	2	0	4	2	3
Cyprus	4	3	2	5	4	0	4	3	2
Czech Republic	3	3	3	4	4	1	3	5	1
Denmark	3	5	1	5	3	1	4	2	3
Estonia	4	3	2	5	3	1	5	3	1
EU27	6	3	0	5	3	1	3	3	3
Finland	1	6	2	3	5	1	2	5	2
France	2	6	1	5	4	0	2	5	2
Germany	2	4	3	6	3	0	3	6	0
Greece	4	5	0	5	3	1	5	3	1
Hungary	6	2	1	4	3	2	3	2	4
Ireland	4	4	1	5	1	3	4	3	2
Italy	5	3	1	6	2	1	4	4	1
Latvia	5	0	4	6	2	1	4	1	4
Lithuania	4	1	4	6	2	1	4	3	2
Luxembourg	4	4	1	3	3	3	2	4	3
Malta	5	3	1	4	4	1	4	3	2
Netherlands	4	3	2	5	2	2	4	2	3
Poland	3	4	2	4	3	2	4	3	2
Portugal	5	4	0	5	4	0	3	5	1
Romania	4	1	4	4	4	1	3	2	4
Slovakia	3	3	3	6	2	1	3	3	3
Slovenia	2	2	5	4	3	2	3	5	1
Spain	4	3	2	5	3	1	4	3	2
Sweden	4	4	1	4	3	2	2	3	4
United Kingdom	4	4	1	4	5	0	5	2	2
TOTAL	**105**	**93**	**54**	**134**	**89**	**29**	**96**	**94**	**62**

Table 6: Trend evaluation of the 8 Europe 2020 indicators for each EU Member State and the EU27 on the basis of the Eurostat definition.

[10] See http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-31-11-224, page S. 42, Section on "1. Indicators without quantitative targets".

The Table 7 and Figure 7 show summaries for each indicator and the three time periods with respect to the number of countries showing a positive, neutral or negative trend. The effects of the economic and financial crises are visible in the delayed decline in the number of indicators that are showing positive developments. Indeed, there are still fewer indicators in the recovery period that are showing positive developments than before the crises. With regard to individual indicators, tertiary education has shown the most upward trend and is also the only indicator that has held steady across the three time periods. GHG emissions and renewable energy show the expected but temporary improvement during times of economic downturn, while the social indicators reflect the rise in unemployment and under-employment that are still at persistently high levels in many EU countries.

	Pre-Crisis (2000-2007)			Crisis onset (2007-MRYA)			Recovery (2009-MRYA)		
Indicator	**Countries with positive trend**	**Countries with neutral trend**	**Countries with negative trend**	**Countries with positive trend**	**Countries with neutral trend**	**Countries with negative trend**	**Countries with positive trend**	**Countries with neutral trend**	**Countries with negative trend**
GHG emissions	1	16	11	22	6	0	9	8	11
Renewable energy	21	3	4	28	0	0	19	5	4
Early school leavers	14	5	9	21	4	3	20	1	7
Tertiary education	24	3	1	25	3	0	24	3	1
Employment rate	6	21	1	6	21	1	6	21	1
Spending on R&D	16	9	3	24	3	1	13	6	9
At risk of poverty and social exclusion	18	2	8	4	11	13	2	6	20
Severe material deprivation	3	16	9	3	20	5	3	20	5
Very low work intensity	2	18	8	1	21	6	0	24	4
Energy efficiency	16	12	0	5	10	13	21	2	5

Table 7: Trend analysis for each indicator for the EU 27 countries (including the EU27)

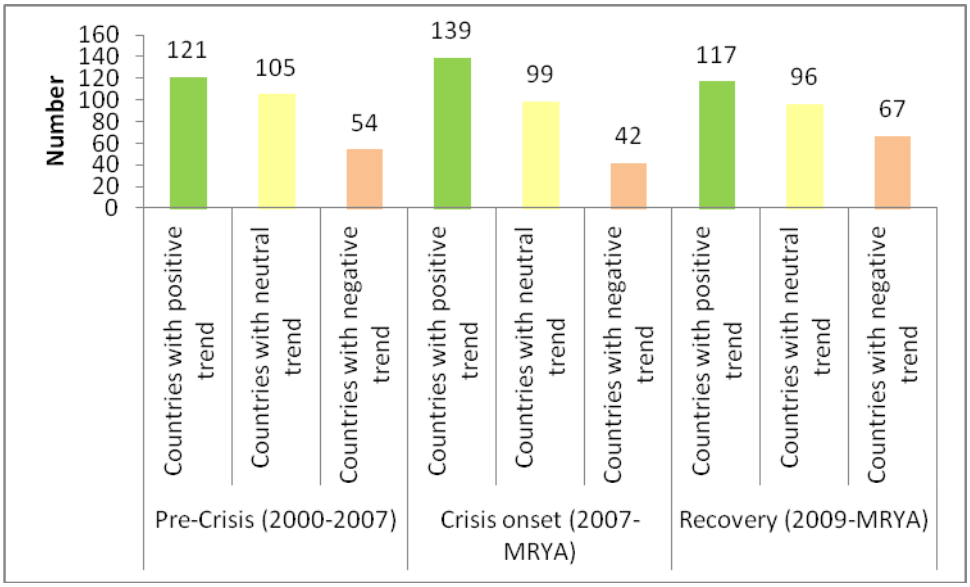


Figure 7: Summary of the number of countries showing positive, neutral or negative trends on all 8 Europe 2020 indicators for three different time periods.

Individual country analyses have also been carried out and comparison with "peer countries" can be done in a myriad of ways. At individual country level, it can be helpful to consider the statistics in the form of a spider graph as shown below for the Netherlands and Austria (Figure 8). This type of chart quickly highlights how countries differ in their progress towards the goals, where the goals have been achieved and where additional effort may be needed.

Figure 8: Spider charts of the DTT values for the eight Europe 2020 indicators for the Netherlands and Austria

The Netherlands are, for example, doing very well on improving GHG emissions (GHG), reducing poverty and social exclusion (POVRISK), the employment rate (EMPLOY) and the share of 30-34 year olds with tertiary degrees (TERTIARY). Investments in R&D (RD) and the school drop-out rate (DROPOUT) are also at high levels relative to the Netherlands' targets for these indicators, while energy efficiency has actually declined in absolute terms. In comparison, Austria is showing a very different picture of progress. Renewable

energy share, GHG emissions, early school leaving and employment rate are all at high levels. Instead, the problem areas are energy efficiency and poverty.

Additional analysis could try to elicit the differences in policies and geographical, socio-economic and other contexts that lead to these different performance snapshots of groups of EU countries. However, any comparison of country-level results using DTT values (and any aggregates thereof) must consider that countries specified individual targets. Ambitiously set targets are hence more likely to not yet be achieved while conservative goals may already indicate success where in fact not much progress in absolute terms has been made.

The Excel database accompanying this report includes individual country charts for each of the eight Europe 2020 indicators. These charts show the temporal development (e.g., Figure 9) based on the available time series as well as the aggregate progress made by each country in the form of the spider charts shown above.

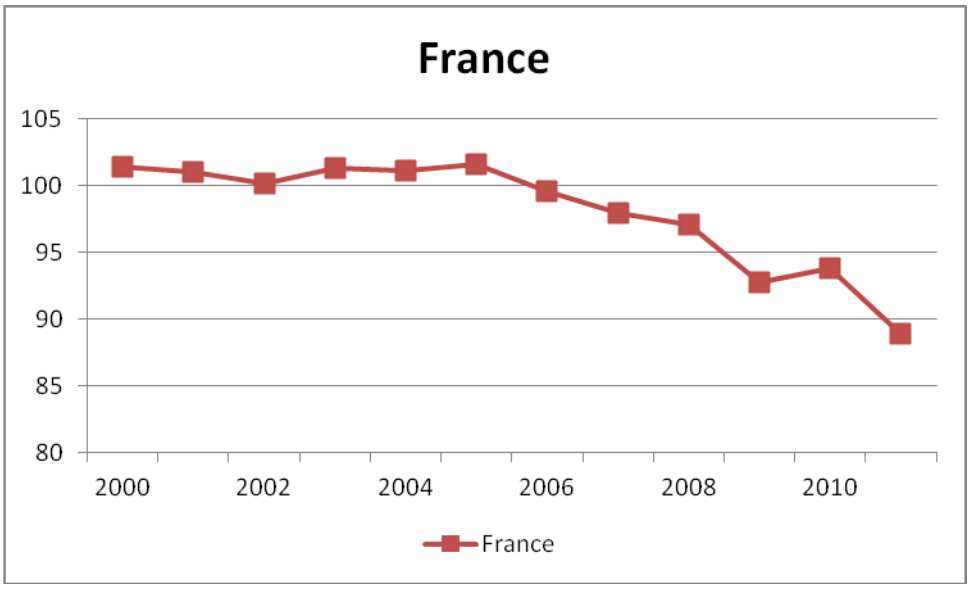


Figure 9: Time series chart showing greenhouse gas emissions for France (1990=100).

Just as the national level indicators can be sliced and analysed from different perspectives and at various levels of detail or depth, the regional progress indicators offer opportunities to gain more insight about the momentum of the Europe 2020 goals at regional level.

9.2 Pilot Regional Progress Indicator (RPI)

The available NUTS2 level data for 272 regions and six Europe 2020 indicators were assembled. Currently, no data on GHG emissions and energy efficiency have been included. Data are also very scarce for the renewable energy indicator, such that no trend analysis was performed.

The regional targets were taken to be the national targets, except for the poverty and social exclusion indicator, for which the targets were apportioned to the regions according to their share of the country's total population in 2011. It might be feasible in the future to use similar apportioning techniques for other indicators.

Indicator	National Target	Regional Target
Employment rate of 20-64 year olds	Varies between 62.9% - 80%	Set to national target
Investment into R&D as percent of GDP	Varies between 0.5% and 4%	Set to national target
GHG emissions	Varies between +20% and -20%	Not evaluated due to lack of NUTS 2 level data
Share of renewable energy	Varies between 10% and 49%	Set to national target
Energy efficiency as measured by reduction in consumption of energy	Varies between 0.2 Mtoe and 38.3 Mtoe	Not evaluated due to lack of NUTS 2 level data
Poverty and social exclusion	Defined and measured differently by MS using essentially four indicators	Broken down according to share of population in each region

Table 8: Specification of regional targets.

Application of the national targets yields distance to targets values for each region to the extent data availability permits. Overall, the availability of such values is very limited with the employment rate values being the most complete, followed by tertiary education, early school leavers, R&D spending, at risk of poverty and social exclusion and renewable energy.

Due to the significant data gaps no composite distance-to-target RPI was calculated at this time. Instead, the analysis can focus on which regions are progressing quickly towards or have already reached the Europe 2020 goals. Knowing these regions might lead to the identification of commonalities and/or best practices that can then be tested in other regions.

The following tables show the leading ten regions on each of the available Europe 2020 indicators.

Spending on R&D

Spending on R&D is high in several regions in Germany but also in regions in the UK, Denmark, Sweden and France. All of the top 10 regions (shown in Table 9) already exceed the EU target of 3% and also their country's targets, which are highest in Finland and Sweden at 4% of GDP. In comparison, Cyprus and Malta only aspire to 0.5% and 0.67%, respectively. Correspondingly, the current levels of R&D spending vary widely across regions from 0.1% in Poland (region Lubuskie) to nearly 8% in Germany (Braunschweig).

Region	Country	R&D Spending (% of GDP, MRYA)
Braunschweig	DE	7.99
Prov. Brabant Wallon	BE	7.66
Stuttgart	DE	6.34
East Anglia	UK	5.57
Hovedstaden	DK	5.31
Oberbayern	DE	4.66
Sydsverige	SE	4.65
Tübingen	DE	4.58
Östra Mellansverige	SE	4.56
Midi-Pyrénées	FR	4.40

Table 9: Leading regions in levels of R&D spending. Note: MRYA=most recent year available in the period 2005-2011.

Employment rate

The employment rate indicator has complete coverage in 2012 and shows generally good performance across the majority of regions. At the top with 80% and more – and exceeding the EU-wide target of 75%– are again regions in Northern Europe as well as regions in Germany, the Netherlands and the UK. Sweden has set the highest goal with "well above 80%, which it so far only meets in the Stockholm, Småland and Western Sweden regions out of eight regions overall (however, its lowest level is achieved in South Sweden with 76.8%, which is still higher than the EU-wide target). Not surprisingly, the top

regions are largely urban areas. At the low end with between 43%-45% are three Italian regions (Sicily, Campalia and Calabria).

Region	Country	Employment level (20-64 years, 2012)
Åland	FI	86.4
Stockholm	SE	82.4
Freiburg	DE	81.8
Oberbayern	DE	81.3
Herefordshire, Worcestershire and Warwickshire	UK	81.1
Småland med öarna	SE	80.8
Utrecht	NL	80.7
Tübingen	DE	80.6
Schwaben	DE	80.3
Berkshire, Buckinghamshire and Oxfordshire	UK	80.3

Table 10: Leading regions on employment level.

Tertiary education

The tertiary education indicator has nearly complete coverage in 2012. Similarly to R&D spending, this indicator favours urban areas, especially medium-to-large cities and urbanized agglomerations, over rural regions due to the necessarily different composition of the local economies. It is therefore not surprising that Table 11 is dominated by regions such as Inner London (UK), the province of Brabant (BE), and Helsinki (FI). All of the top ten regions exceed the European goal of 40%, but several major cities have only middling shares of 30-34 year olds with advanced degrees: Vienna (AT) with 28%, Cologne (DE) with 28.6%, Berlin (DE) with 37.0% and Prague (CZ) with 37.5%. Low rates of professionals with tertiary degrees are mainly found the rural areas of nearly every country but Italy stands out with all of its 21 NUTS 2 regions having shares of 20% and below.

Region	Country	Tertiary Education (%, 2012)
Inner London	UK	63.0
Prov. Brabant Wallon	BE	51.2
Helsinki-Uusimaa	FI	48.9
Berkshire, Buckinghamshire and Oxfordshire	UK	47.5
País Vasco	ES	46.6
Hovedstaden	DK	46.2
Eastern Scotland	UK	46.2
Outer London	UK	45.8
Surrey, East and West Sussex	UK	45
Stockholm	SE	44.4

Table 11: Leading regions in levels of tertiary education

Early school leavers

This indicator also has nearly complete coverage in 2012 and the top ranks are dominated by new EU Member States in Central and Eastern Europe. All ten are far below the EU-wide target of 10%, indeed 105 regions had dropout rates below 10% in 2012. In contrast, the highest dropout rates exceed 25% with a maximum of 39.6%. Eight out of the ten regions with the highest dropout rates are in Spain and two are in Portugal.

Region	Country	Early school leaversn (%, 2012)
Praha	CZ	2.4
Małopolskie	PL	2.8
Západné Slovensko	SK	3
Střední Čechy	CZ	3.6
Jihovýchod	CZ	3.6
Jadranska Hrvatska	HR	3.8
Zahodna Slovenija	SI	3.8
Югозападен (Yugozapaden)	BG	4
Střední Morava	CZ	4.1
Świętokrzyskie	PL	4.2

Table 12: Leading regions in levels of low early school leavers rate.

Poverty and social exclusion

The poverty and social exclusion indicator is the most challenging to evaluate because countries have specified reduction goals according to different poverty measurement methodologies. In addition, the choice of reference year plays an important role for the results due to the economic crisis and the situation for the new EU Member States, which have seen significant, albeit not continuous, upward trends in per capita income following their accession to the EU. Data coverage varies and the most recent available year for the period 2009-2012 was used.

The top ten regions with respect to the percentage of the population at risk of poverty and social exclusion are located in Romania, the Czech Republic, Finland, Slovakia and Italy. They tend to be urban areas with high average per capita GDP. The recent years have seen significant movements in this indicator and this indicator is also characterized by the largest relative spread in values. Poverty and social exclusion is highest in Sicily (IT), Campania (IT), Canary Islands (Spain), North-East Romania, Calabria (IT) and Inner London (UK) with values at or above 32%. Figure 5 shows the distribution of poverty and social exclusion across the NUTS 2 regions.

Region	Country	Reduction in poverty and social exclusion (% of target, MRYA)
Bucureşti - Ilfov	RO	3.4
Praha	CZ	6.2
Jihozápad	CZ	7
Helsinki-Uusimaa	FI	7.1
Bratislavský kraj	SK	7.2
Střední Čechy	CZ	7.3
Provincia Autonoma di Bolzano/Bozen	IT	7.9
Severovýchod	CZ	8.2
Emilia-Romagna	IT	8.2
Valle d'Aosta/Vallée d'Aoste	IT	8.4

Table 13: Leading regions in the share of people at risk of poverty and social exclusion (% of population)

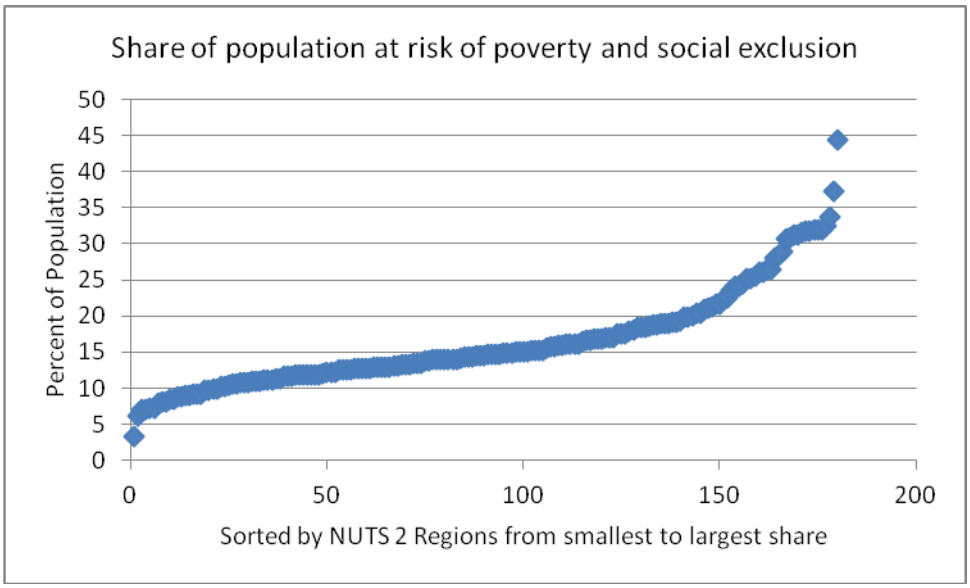


Figure 10: Distribution of values for the poverty and social exclusion indicator for the MRYA in the period 2009-2012.

Renewable energy

The renewable energy indicator has very low data availability (only 24 data points for the MRYA), which makes its evaluation more difficult. Nonetheless, Table 14 shows substantial variation in the share of renewable energy across regions. It is highest in Latvia and lowest in Vienna (AT) at 0.04%.

Region	Country	Renewable energy share (%, MRYA)
Latvija	LV	29.94
Lietuva	LT	18.4
Közép-Dunántúl	HU	8.95
Região Autónoma da Madeira	PT	7.48
Észak-Alföld	HU	6.48
Região Autónoma dos Açores	PT	6.47
Észak-Magyarország	HU	6.13
Nyugat-Dunántúl	HU	5.79
Dél-Dunántúl	HU	5.57
Κύπρος (Kýpros)	CY	4.38

Table 14: Leading regions in the share of renewable energy (MRYA).

Trend analysis

To shed more light on the progress that has been made by the regions a trend analysis has been carried out using Eurostat's criterion of at least a 1% annual growth rate in absolute terms as a sign for a significant up- or downward trend.

Three time periods were examined. The first considers the time before the onset of the financial and economic crises, i.e., the period up to 2007. The second evaluates developments since 2007 and the third assesses progress since the worst of the dual crises was over in the majority of EU Member States starting in 2009. These time periods are termed pre-crisis, crisis onset and recovery.

Table 15 shows the number of regions with positive, negative and neutral trends for the pre-crisis period 2000-2007.

Indicator	Period	Positive trend	Neutral trend	Negative trend
Employment rate	pre-crisis	85	153	7
	crisis onset	17	171	67
	recovery	35	171	66
Tertiary education	pre-crisis	196	30	6
	crisis onset	235	16	0
	recovery	222	30	10
Early school leavers	pre-crisis	113	47	31
	crisis onset	161	39	39
	recovery	153	30	63
R&D spending	pre-crisis	74	40	36
	crisis onset	68	11	20
	recovery	50	11	39
Poverty and social exclusion	pre-crisis	65	16	23
	crisis onset	35	25	58
	recovery	32	9	58

Table 15: Summary of trend analysis for the three time periods. Note: regions with missing trend assessments due to lack of data are not counted.

The table above provides several insights. First, for all time periods tertiary education levels and early school leaver rates were showing significantly positive developments in the majority of regions. The employment rate in contrast hovered at stagnating levels for most regions and R&D spending as well as poverty and social exclusion exhibited a more mixed picture. Second, the trend assessments clearly show the devastating impact of the economic and financial crises. In all indicators, the number of regions with positive trends plummeted from pre-crisis to levels. And in all but the employment rate indicator, recovery levels are still below the values seen in the crisis onset period and the recovery has been slow at best.

	Pre-crisis				Crisis onset				Recovery			
Indicator	**Regions improving**	**Regions stagnating**	**Regions declining**	**Regions without data**	**Regions improving**	**Regions stagnating**	**Regions declining**	**Regions without data**	**Regions improving**	**Regions stagnating**	**Regions declining**	**Regions without data**
Employment rate among 20-64 year olds	85	153	7	27	17	171	67	17	35	171	66	0
Tertiary educational attainment	196	30	6	40	235	16	0	21	222	30	10	10
Early school leavers	113	47	31	81	161	39	39	33	153	30	63	26
R&D spending	74	40	36	122	68	11	20	173	50	11	39	172
People at risk of poverty and social exclusion	65	16	23	168	35	25	58	154	32	9	58	173
GHG emissions	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data
Share of renewable energy**	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated	not evaluated
Increase in energy efficiency	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data

Table 16: Summary of trend assessment on a regional basis for the three time periods considered.

*Trend is assessed by calculating the annualised growth rate over the given time period. A trend is considered significant if it exceeds 1% in absolute terms.

** The renewable energy indicator has not been evaluated due to data scarcity.

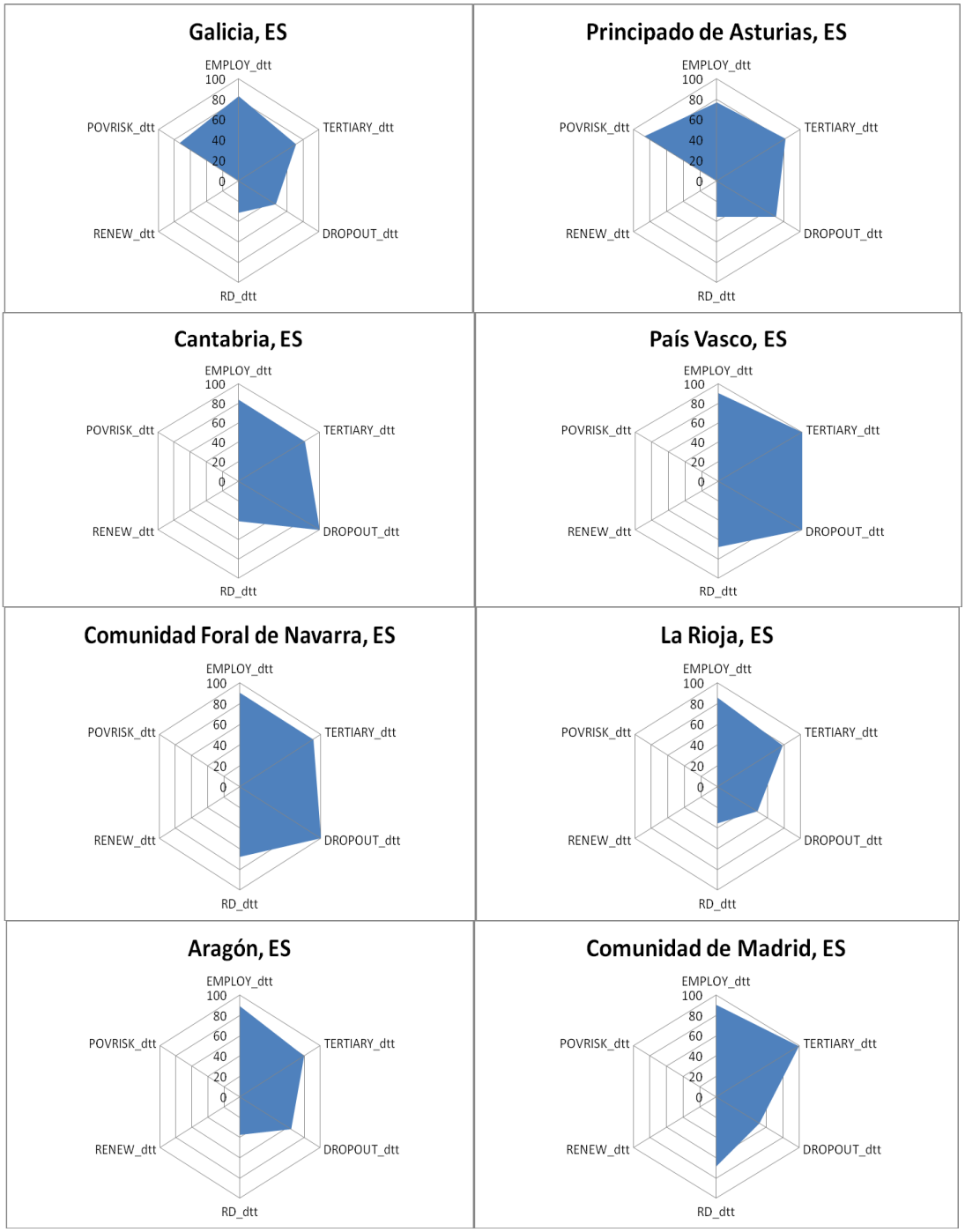
After examining time trends at the indicator level, it is also useful to look at it at the regional level. The following table summarizes how many and which regions are leading in terms of overall progress and which are falling behind. Among the NUTS 2 regions with the highest level of data availability (at least 80%) for the pre-crisis (2000 – 2007) and the recovery period (2009 – present), Table 17 shows how these regions' positive, stagnating or negative indicator trends changed between the two periods. Of these 29 regions (all in Spain and Italy), 25 have experienced a decline in progress, two improved and two remained unchanged.

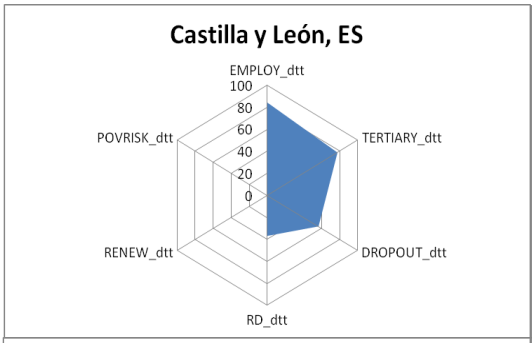
		Pre-Crisis (2000-2007)			Recovery (2009-MRYA)		
Region	**Country**	**Positive**	**Stagnating**	**Negative**	**Positive**	**Stagnating**	**Negative**
Galicia	ES	5	0	0	2	2	1
Principado de Asturias	ES	3	1	1	4	0	1
Cantabria	ES	3	0	2	3	0	2
País Vasco	ES	4	1	0	2	1	2
Comunidad Foral de Navarra	ES	3	1	1	2	0	3
La Rioja	ES	3	0	2	1	2	2
Aragón	ES	3	0	2	2	1	2
Comunidad de Madrid	ES	4	0	1	2	1	2
Castilla y León	ES	3	0	2	2	0	3
Castilla-La Mancha	ES	2	2	1	3	0	2
Extremadura	ES	5	0	0	3	0	2
Cataluña	ES	4	0	1	2	0	3
Comunidad Valenciana	ES	3	1	1	2	0	3
Illes Balears	ES	3	2	0	3	0	2
Andalucía	ES	4	1	0	3	0	2
Región de Murcia	ES	4	1	0	4	0	1
Canarias	ES	3	1	1	3	0	2
Piemonte	IT	5	0	0	2	1	2
Valle d'Aosta /Vallée d'Aoste	IT	3	1	1	2	2	1
Liguria	IT	3	1	1	1	2	2
Lombardia	IT	5	0	0	4	1	0
Abruzzo	IT	4	1	0	2	1	2
Molise	IT	4	1	0	3	0	2
Campania	IT	5	0	0	2	1	2
Puglia	IT	3	1	1	2	1	2
Basilicata	IT	3	0	2	3	0	2
Calabria	IT	4	0	1	1	3	1
Sicilia	IT	3	2	0	1	1	3
Sardegna	IT	3	0	2	2	1	2

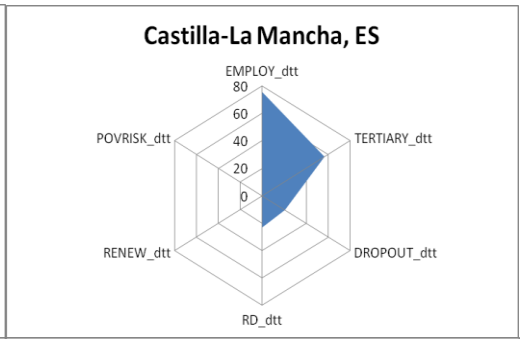
Table 17: Comparison of progress among the regions with complete data coverage during the recovery period (2009-present).

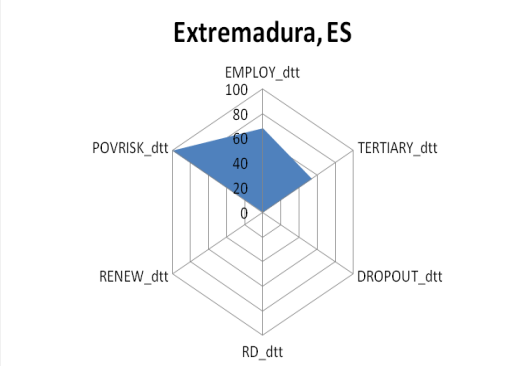
Cross-indicator analysis

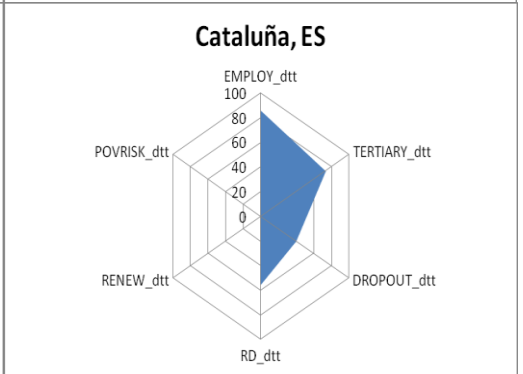
For the same 29 regions analysed for their time trends, spider charts are presented to show the distribution of their current DTT values.

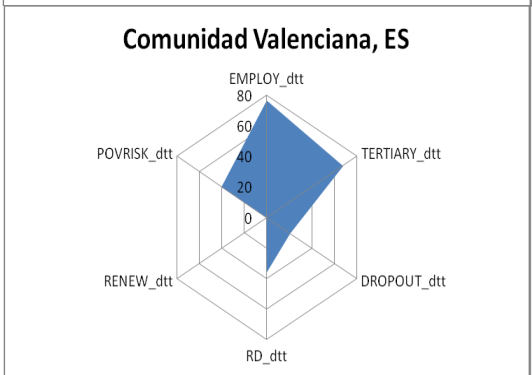


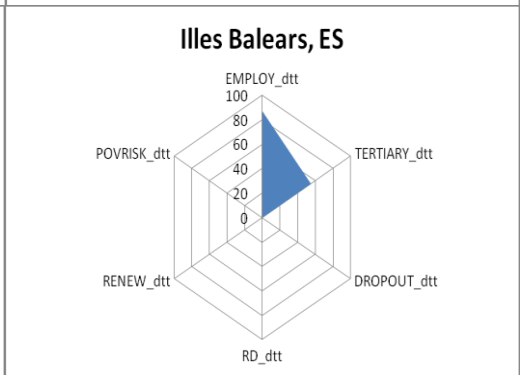

Castilla y León, ES
EMPLOY_dtt
100
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt

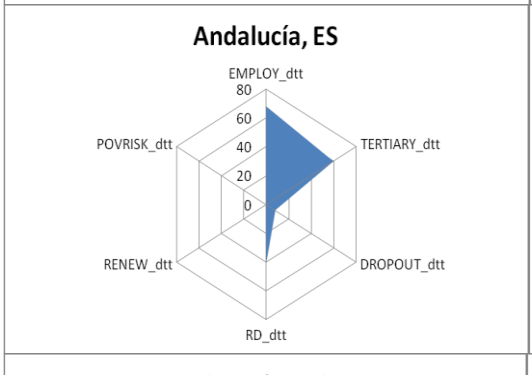

Castilla-La Mancha, ES
EMPLOY_dtt
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt

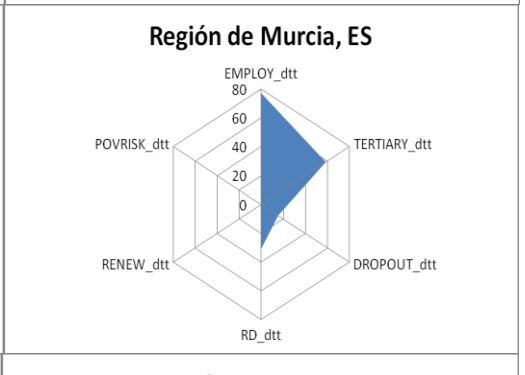

Extremadura, ES
EMPLOY_dtt
100
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt

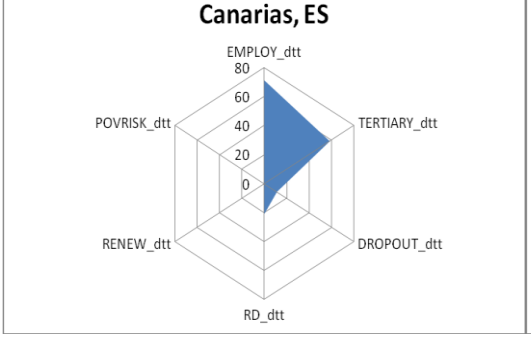

Cataluña, ES
EMPLOY_dtt
100
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt

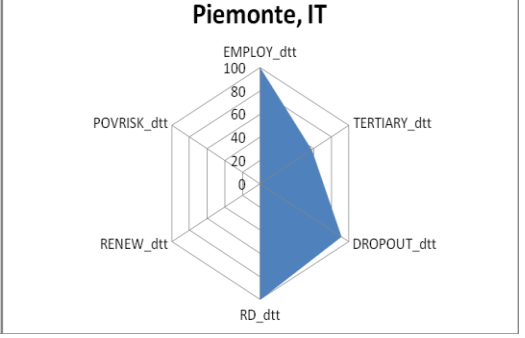

Comunidad Valenciana, ES
EMPLOY_dtt
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt

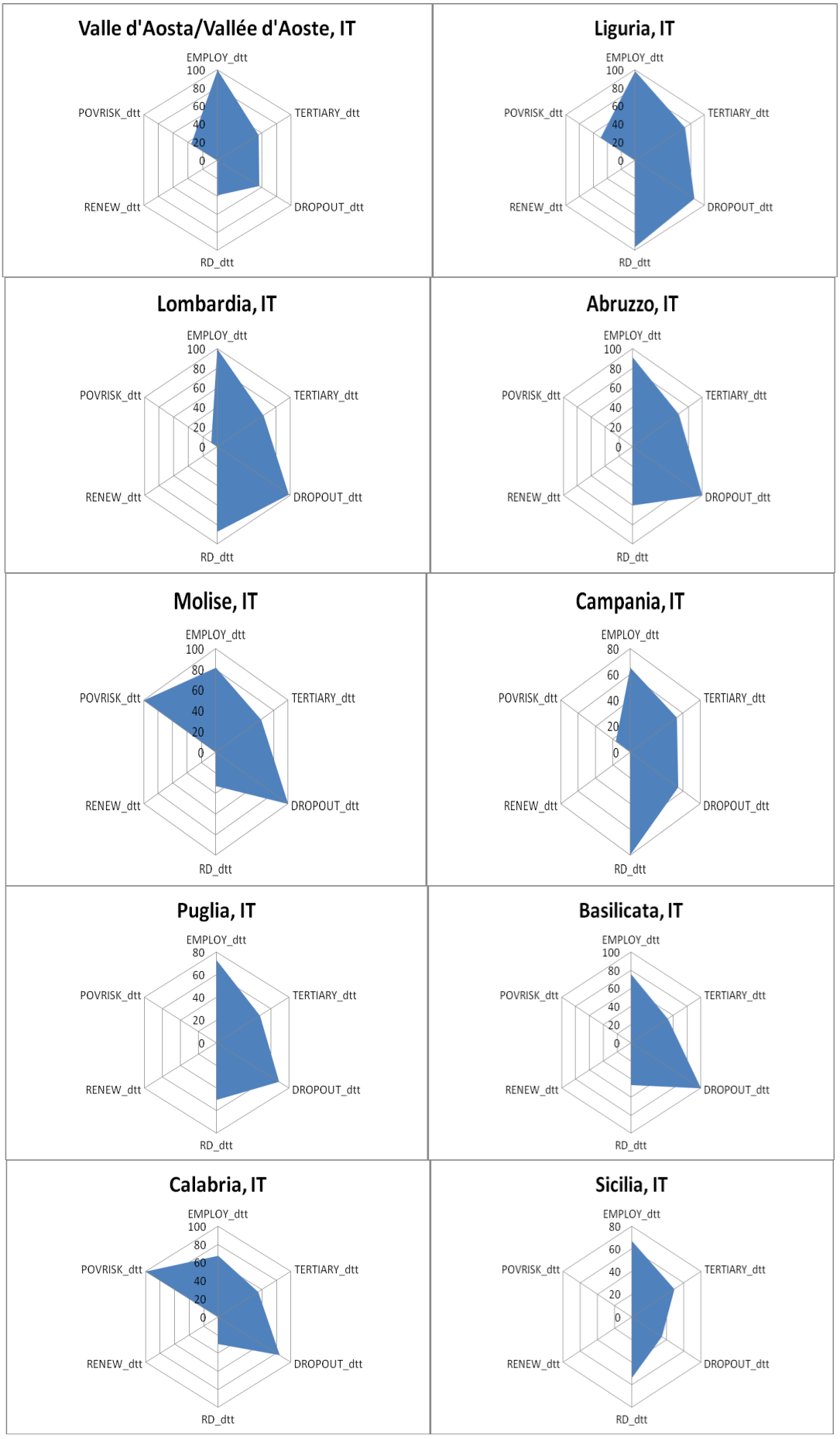

Illes Balears, ES
EMPLOY_dtt
100
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt


Andalucía, ES
EMPLOY_dtt
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt


Región de Murcia, ES
EMPLOY_dtt
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt


Canarias, ES
EMPLOY_dtt
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt


Piemonte, IT
EMPLOY_dtt
100
80
60
40
20
0
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt


Valle d'Aosta/Vallée d'Aoste, IT
Liguria, IT
Lombardia, IT
Abruzzo, IT
Molise, IT
Campania, IT
Puglia, IT
Basilicata, IT
Calabria, IT
Sicilia, IT
EMPLOY_dtt
TERTIARY_dtt
DROPOUT_dtt
RD_dtt
RENEW_dtt
POVRISK_dtt
0
20
40
60
80
100

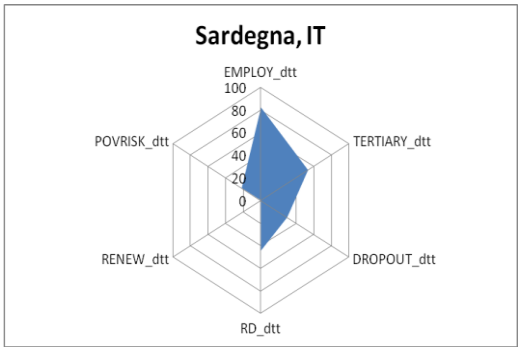
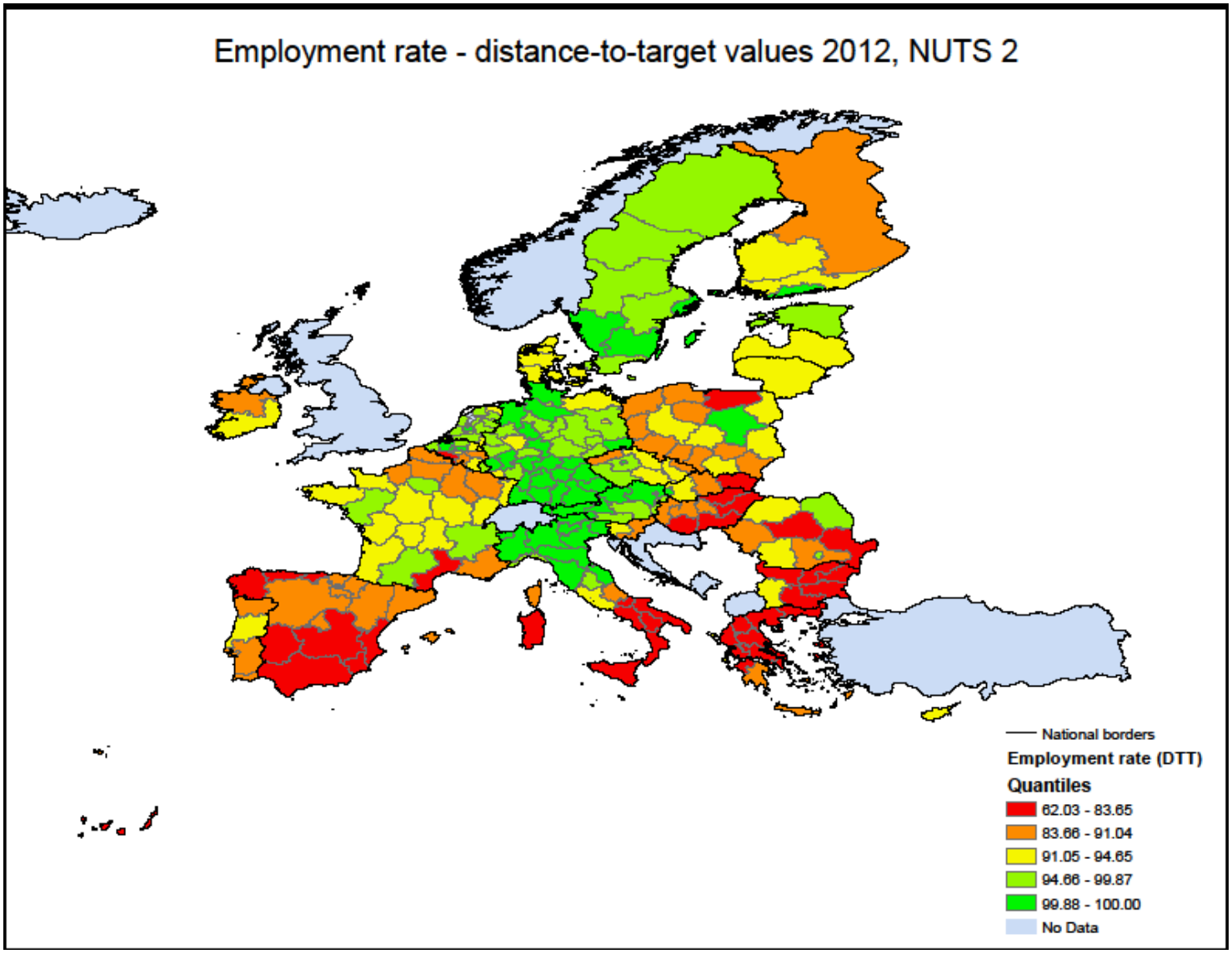


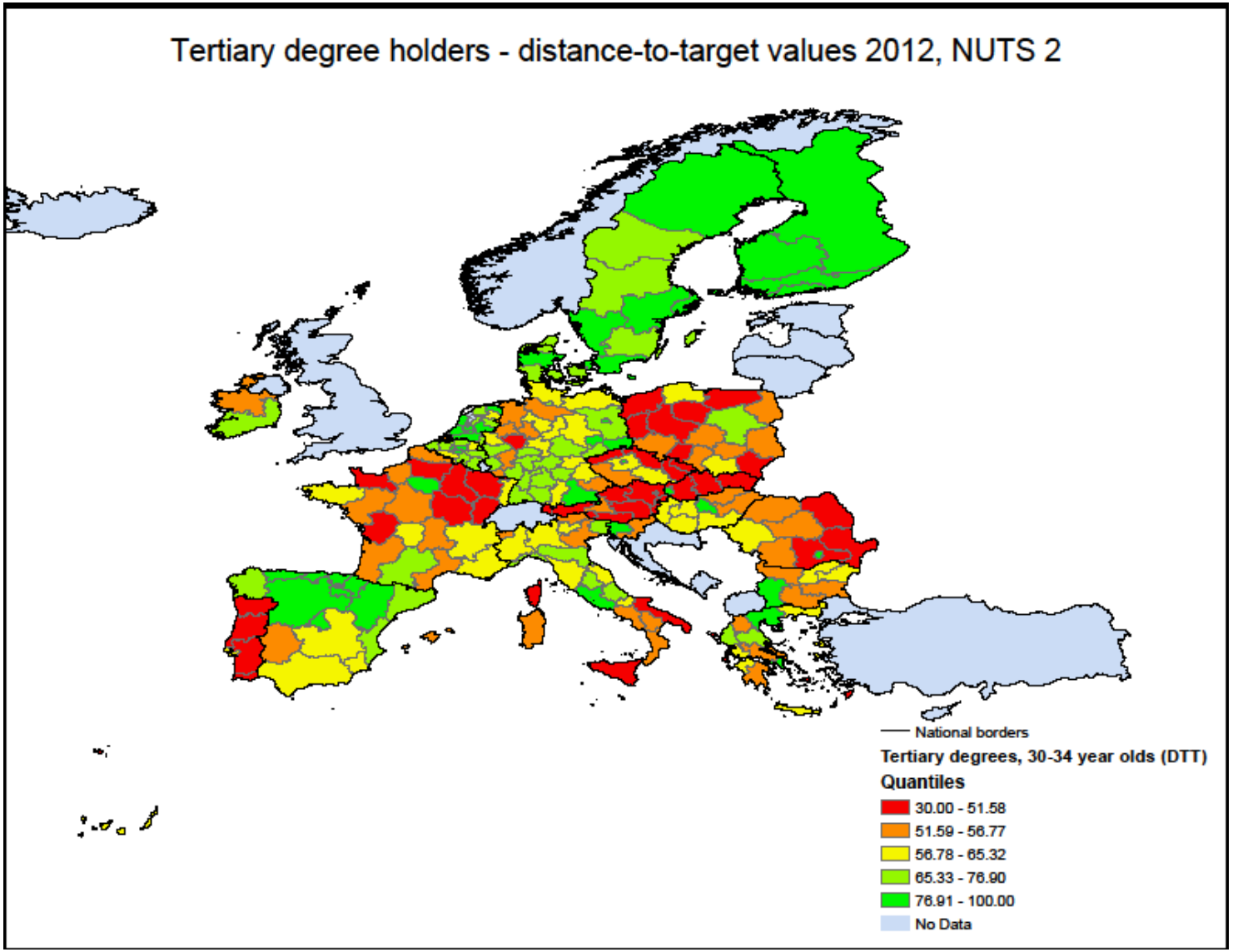
Figure 11: Spider charts of selected regions with full data coverage.

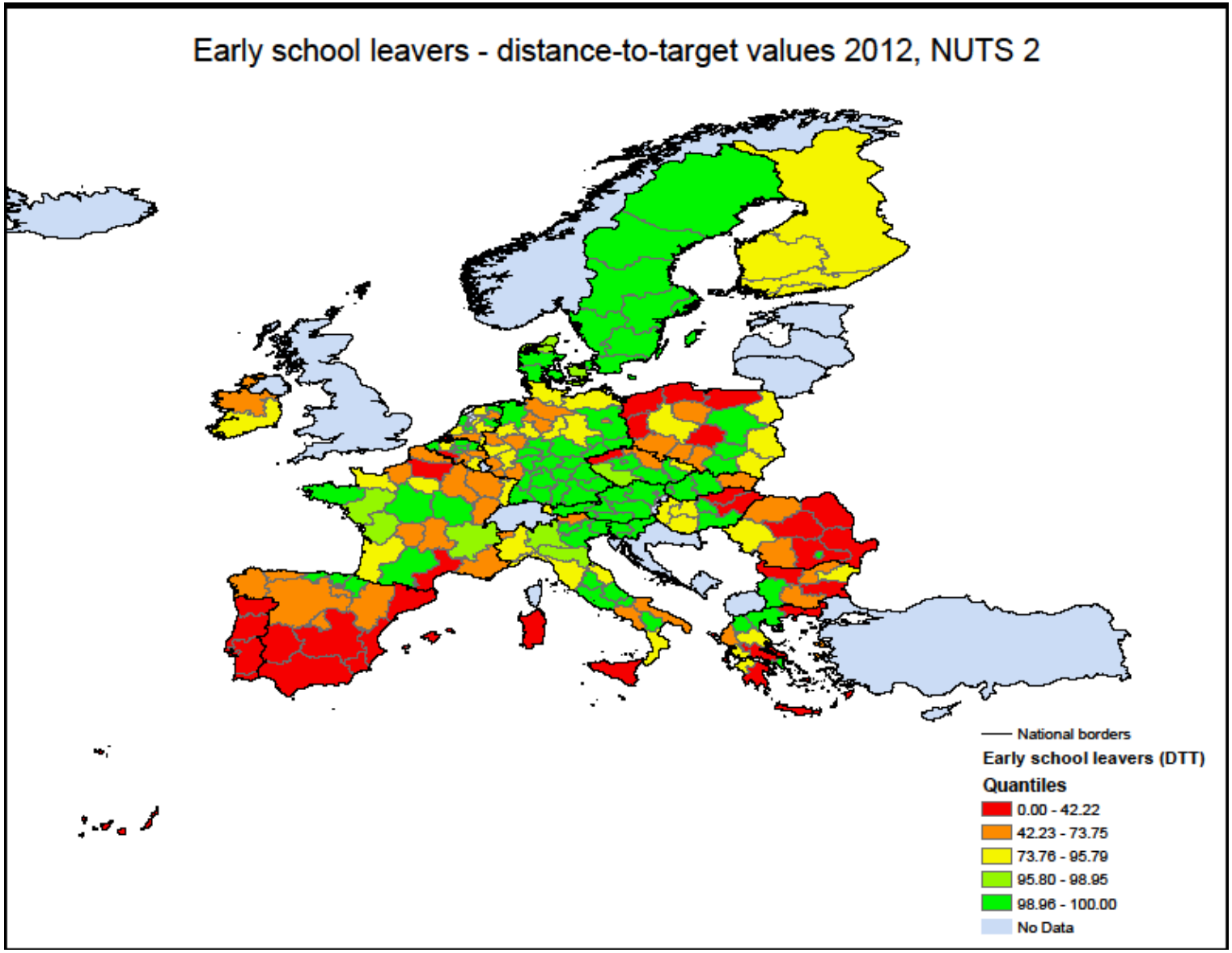
The spider charts provide further evidence that progress towards the available six indicators is not homogeneous across the regions. Employment rates are most consistent and data on renewable energy are too scarce to draw meaningful conclusions, but the remaining indicators exhibit substantial variation across regions and in some cases, the current poverty DTT values are even negative due to net additions to the number of people at risk of poverty and social exclusion.

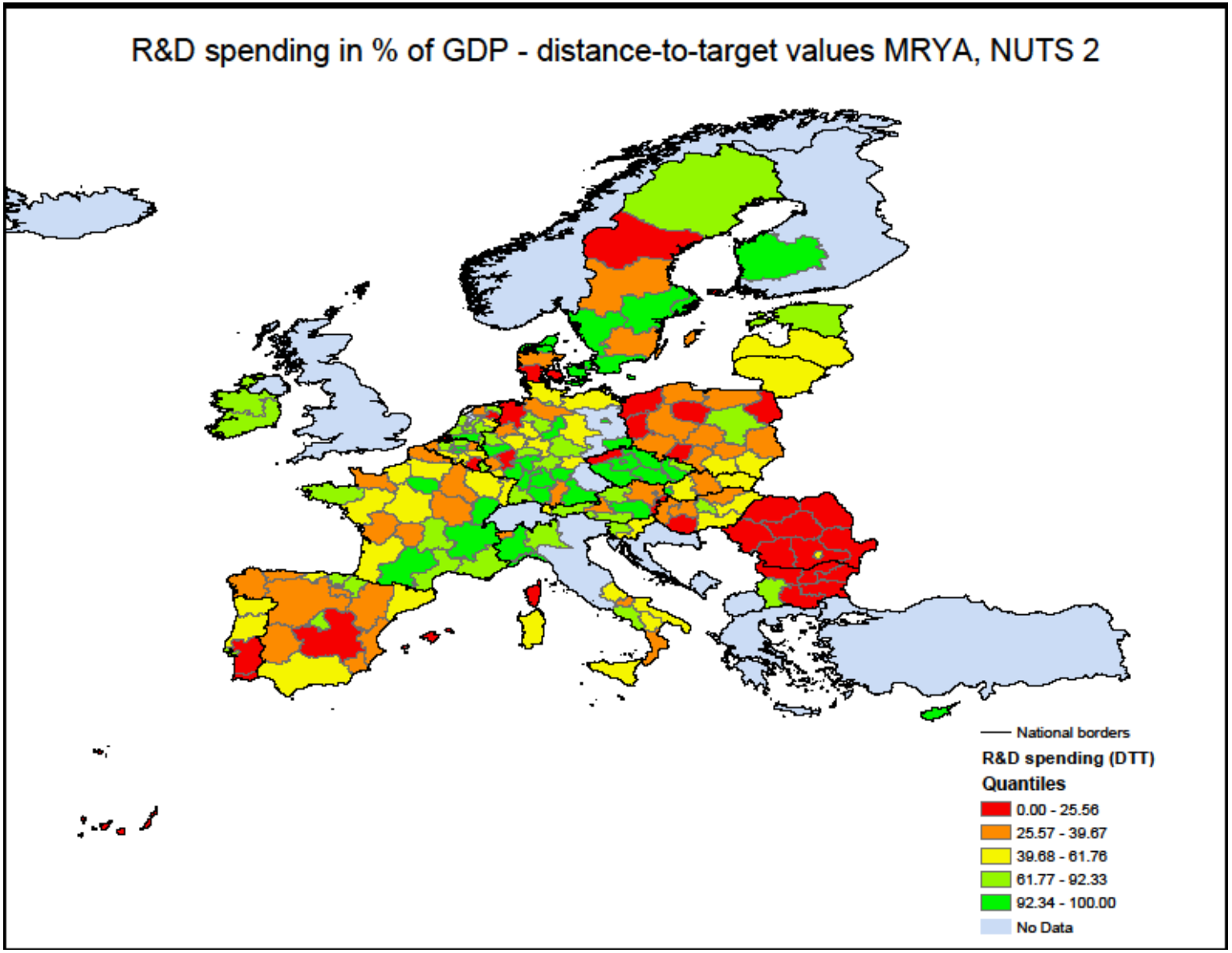
Spatial analysis

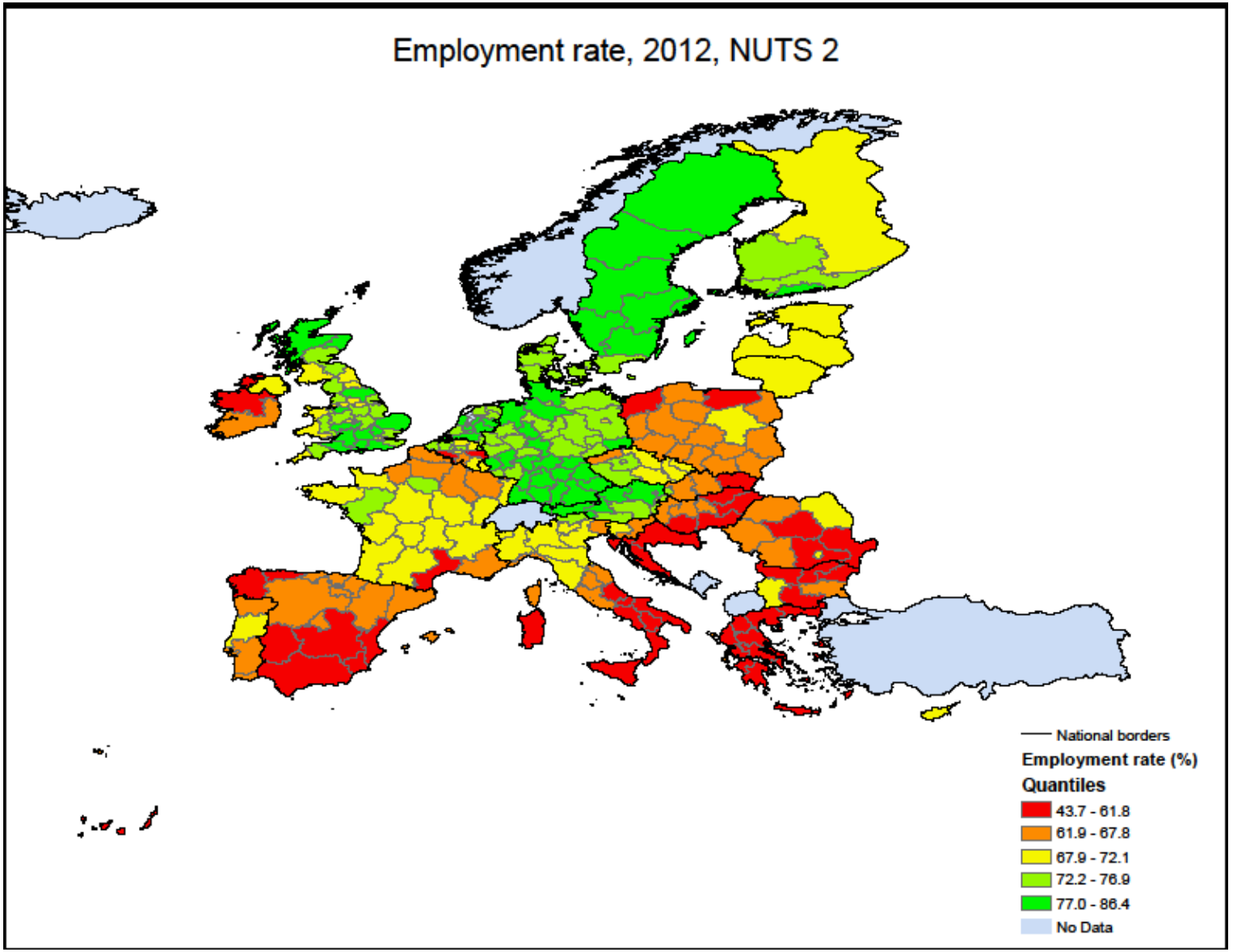
When the objective is to monitor progress towards the Europe 2020 Strategy, focus should not only rest on changes in the indicators over time. Europe also has spatial diversity and visualizing the indicators in map form can help to identify patterns and relationships that would otherwise go unnoticed. The following maps therefore show the indicators available at NUTS 2 level with respect to their distance-to-target values, most recent data points and time trends. Each of these spatial visualizations shows its own unique patterns. So while the DTT values show which regions are currently closest to reaching their country's targets, the current data show the regions currently leading or lagging behind and the time trends showing progress over time to identify the fastest/slowest-moving regions.

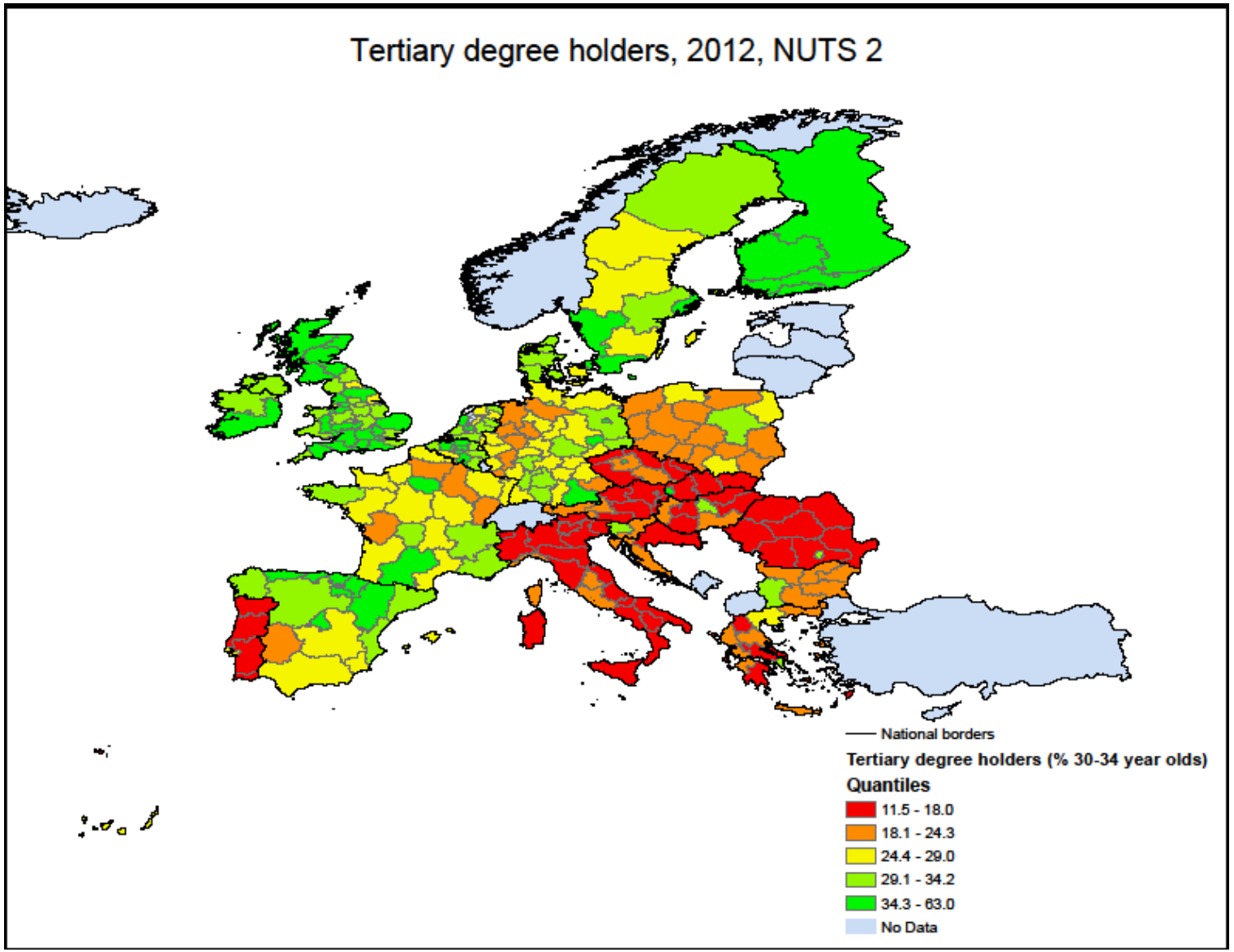

Employment rate - distance-to-target values 2012, NUTS 2
National borders
Employment rate (DTT)
Quantiles
62.03 - 83.65
83.66 - 91.04
91.05 - 94.65
94.66 - 99.87
99.88 - 100.00
No Data

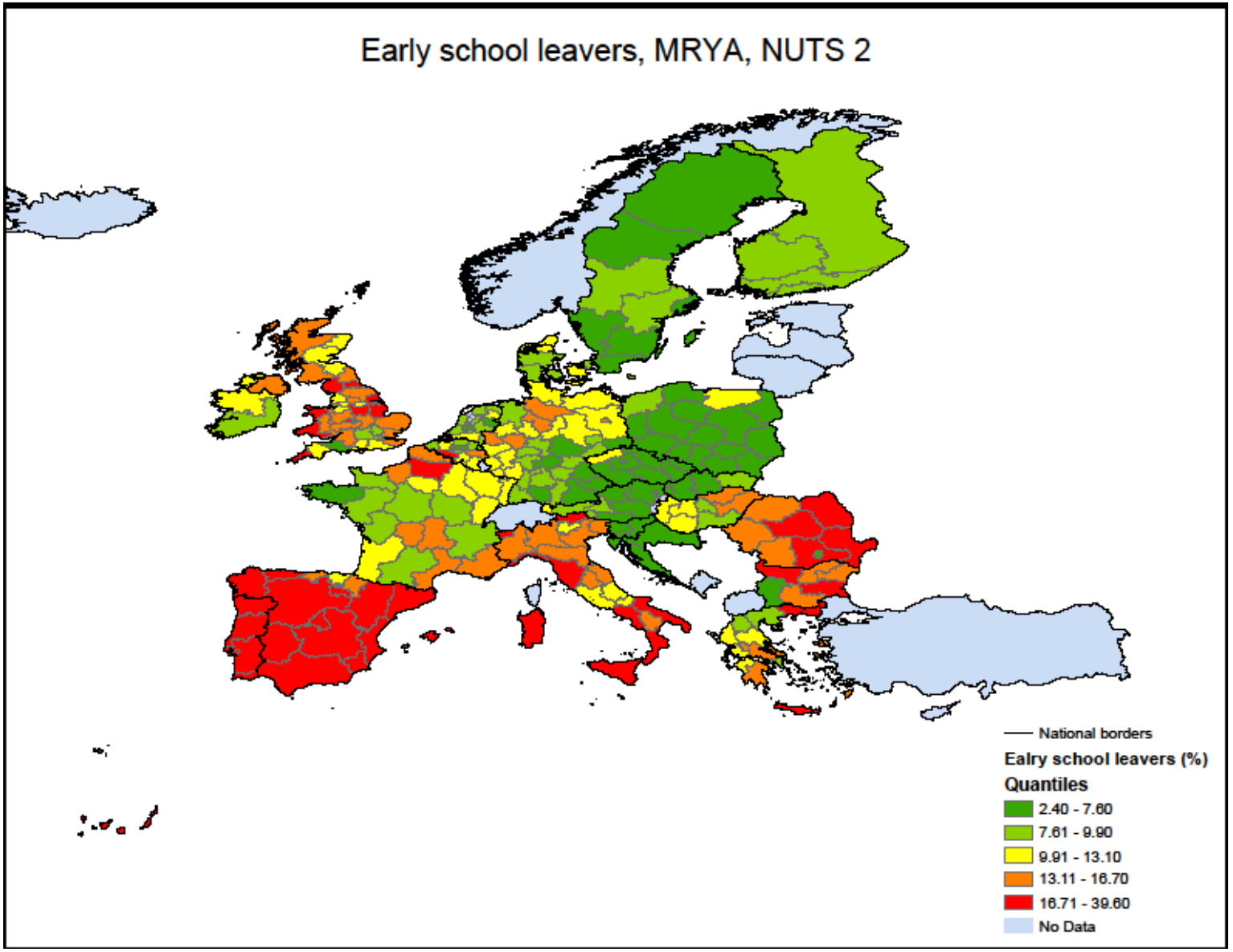

Tertiary degree holders - distance-to-target values 2012, NUTS 2
National borders
Tertiary degrees, 30-34 year olds (DTT)
Quantiles
30.00 - 51.58
51.59 - 56.77
56.78 - 65.32
65.33 - 76.90
76.91 - 100.00
No Data

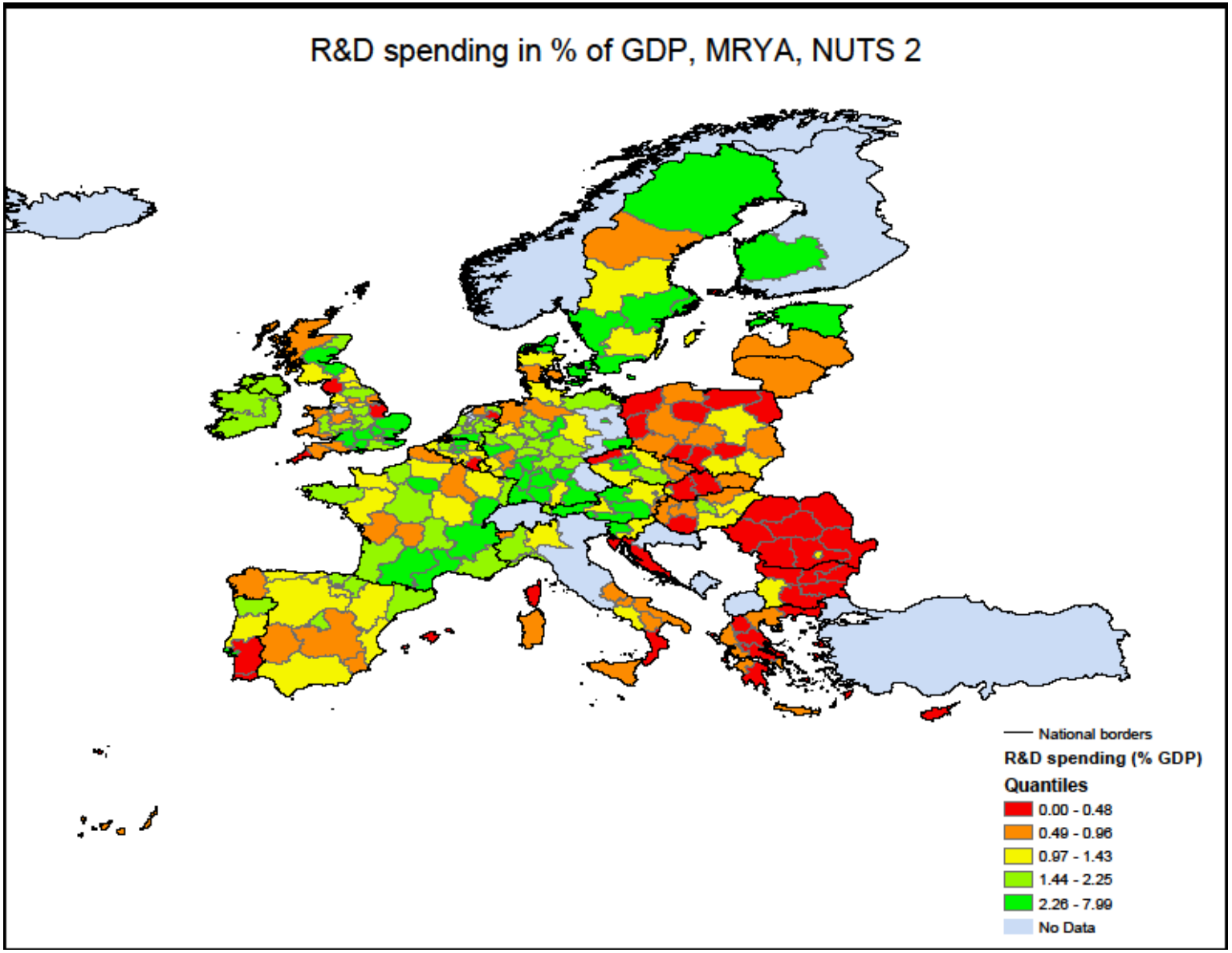

Early school leavers - distance-to-target values 2012, NUTS 2
National borders
Early school leavers (DTT)
Quantiles
0.00 - 42.22
42.23 - 73.75
73.76 - 95.79
95.80 - 98.95
98.96 - 100.00
No Data

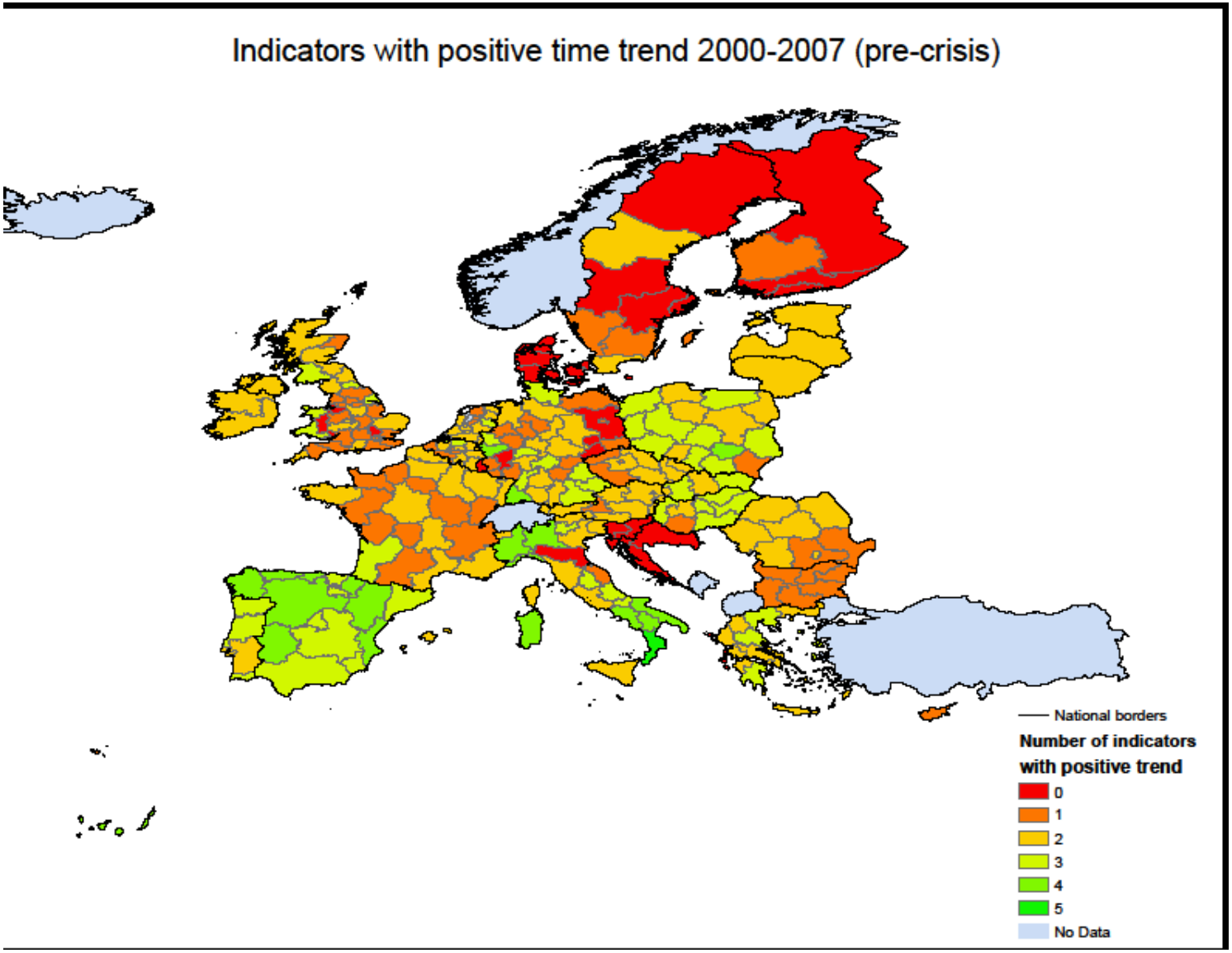

R&D spending in % of GDP - distance-to-target values MRYA, NUTS 2
National borders
R&D spending (DTT)
Quantiles
0.00 - 25.56
25.57 - 39.67
39.68 - 61.76
61.77 - 92.33
92.34 - 100.00
No Data

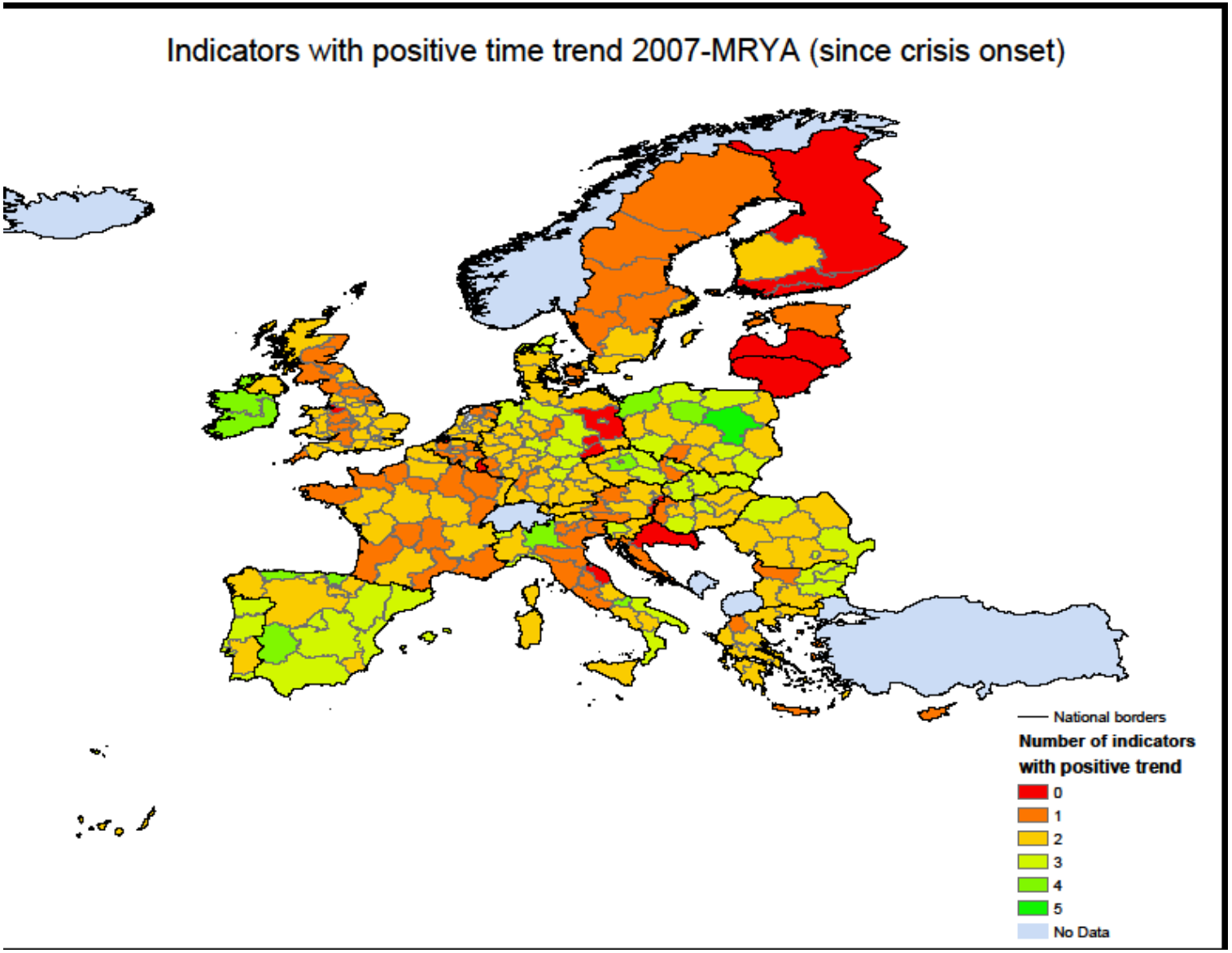

Employment rate, 2012, NUTS 2
National borders
Employment rate (%)
Quantiles
43.7 - 61.8
61.9 - 67.8
67.9 - 72.1
72.2 - 76.9
77.0 - 86.4
No Data

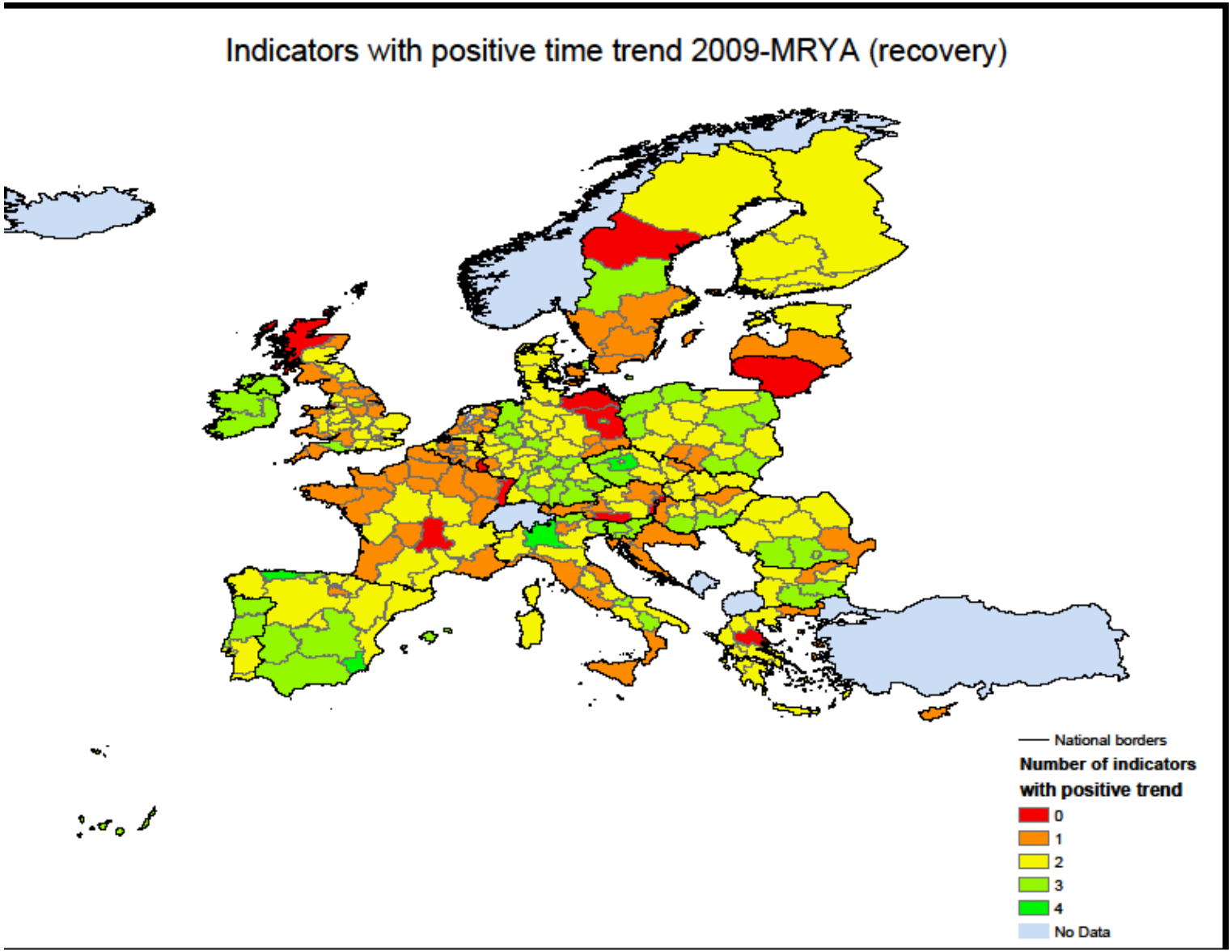

Tertiary degree holders, 2012, NUTS 2
National borders
Tertiary degree holders (% 30-34 year olds)
Quantiles
11.5 - 18.0
18.1 - 24.3
24.4 - 29.0
29.1 - 34.2
34.3 - 63.0
No Data


Early school leavers, MRYA, NUTS 2
National borders
Ealry school leavers (%)
Quantiles
2.40 - 7.60
7.61 - 9.90
9.91 - 13.10
13.11 - 16.70
16.71 - 39.60
No Data


R&D spending in % of GDP, MRYA, NUTS 2
National borders
R&D spending (% GDP)
Quantiles
0.00 - 0.48
0.49 - 0.96
0.97 - 1.43
1.44 - 2.25
2.26 - 7.99
No Data


Indicators with positive time trend 2000-2007 (pre-crisis)
National borders
Number of indicators with positive trend
0
1
2
3
4
5
No Data


Indicators with positive time trend 2007-MRYA (since crisis onset)
National borders
Number of indicators with positive trend
0
1
2
3
4
5
No Data


Indicators with positive time trend 2009-MRYA (recovery)
National borders
Number of indicators
with positive trend
0
1
2
3
4
No Data

10. Database Documentation

The results of the NPI and pilot RPI are calculated in a step-by-step approach in two MS Excel databases, the first containing the necessary data in NUTS0 resolution and the second at NUTS2 level. These databases can be used to update the indicators and indices when new data become available and to conduct further analyses. The databases are also the data input for the maps presented in Section 10, which were produced with ESRI ArcMap version 10.1. The following sub-sections describe the database structures and how they can be updated and utilised.

10.1 General Database Structure

The NUTS0 and NUTS2 databases consist of interlinked Excel spreadsheets, i.e., the various worksheets contained therein are linked through mathematical formulae and look-up links. They follow the same principal structure. This section elaborates on the database structure and explains how future updates to the database – and NPI and RPI – could be made in a relatively straightforward manner. Table 18 and Table 19 show the names of the individual spreadsheets and a description of their contents.

Spreadsheet label	Purpose
DataSources	Lists important metadata, including the indicator codes, data sources, units of measurement, dates of download, dates of last update by Eurostat and URL link to the data table
GHG, RENEW, DROPOUT, TERTIARY, EMPLOY, RD, ENEFF, POVRISK, MATDEP, WORKINT	These spreadsheets contain the raw, unmanipulated data for each indicator as downloaded from Eurostat. They also contain the calculations for the trend assessments.
Targets	Lists the national targets for each indicator
Matrix	This is the key summary spreadsheet that contains the current value (last available year), several trend assessments and the DTT values for each country
NPI	Shows the NPI calculated for each country using the most recent available DTT values
NPI_Chart, SubNPI_Charts, SubNPI_StackedCharts, Trends, CountryCharts, SpiderCharts, SpiderCharts_Pillars, TrendTable, DTT_CurrentValue_Table, MoreCharts, Trend_ByIndicator	These spreadsheets contain a variety of graphics and tables presented in the study report. They are not part of the core data and calculations and can be updated or modified on an optional basis.

Table 18: Names and purposes of the spreadsheets in the NUTS0 database

For the NUTS2 database, the list of spreadsheets is given in Table 19.

Spreadsheet label	Purpose
DataSources	Lists important metadata, including the indicator codes, data sources, units of measurement, dates of download, dates of last update by Eurostat and URL link to the data table
NUTS2	The most recent list of NUTS 2 regions and their codes from Eurostat
regpop	Regional population, which is needed to apportion the poverty indicator to the regions
natpop	National population, which is needed to apportion the poverty indicator to the regions
employ, tertiary, dropout, rd, renew, povrisk	These spreadsheets contain the raw, unmanipulated data for each indicator as downloaded from Eurostat. They also contain the calculations for the trend assessments.
Targets	Lists the national targets for each indicator
RPI_DTT	This is the key summary spreadsheet that contains the current value (last available year), the applicable target and the untruncated DTT values for each region
RPI_DTT_FINAL	This is the summary spreadsheet with the final, truncated DTT values, i.e., DTT values that are confined to the 0 to 100 interval
DataAvailability, TrendAssessmentIndicators, RegionalProgress, employ_top10, tertiary_top10, dropout_top10, rd_top10, renew_top10, povrisk_top10, SpiderCharts, MostImproved_2009toMRYA, HighestDataAvailability	These spreadsheets contain a variety of graphics and tables presented in the study report. They are not part of the core data and calculations and can be updated or modified on an optional basis.

Table 19: Names and purposes of the spreadsheets in the NUTS2 database

10.1.1 Worksheets in the NUTS0 database

The first spreadsheet is titled “Data Sources”. It consists of 10 columns. These columns provide information about the origin of the data used in the calculations, when the data were obtained (downloaded) and where from. Specifically, this spreadsheet provides the following information.

Column	Information
Tab Name	This field lists the tab labels for all worksheets in the database.
Data file code	This is the code used internally by the contractor to refer to the data set specified in Tab Name.
Indicator	Name of the indicator as specified by the original data provider.
UNIT	Unit of measurement of the indicator as specified by the original data provider.
Coverage	Temporal coverage of the indicators.
Source of Data:	Original data provider.
Last update:	Date that the data were updated by the original data provider for the last time.
Date of extraction:	Date that the data were obtained (downloaded) by the contractor.
Hyperlink to the table:	Link to the location from which the data set was obtained (downloaded). This might not be a website maintained by the original data source (e.g., EEA is the original data provider but the data file was obtained from Eurostat).
General Disclaimer of the EC:	Legal information provided by the link source from which the data were obtained (downloaded).
Code:	Code used by the link source from which the data were obtained (downloaded).

Updates: Any updates of the data contained in the NUTS0 database should be reflected in the "Data Source" worksheet in order to ensure that all original data sources, their timeliness and the date of access can be correctly identified.

Additions: Additional indicators can be added by including an additional line at the bottom of the table and filling in the information for each of the table columns.

***GHG* Worksheet**

The spreadsheet titled "GHG" contains the data for the Europe 2020 indicator *Greenhouse Gas Emissions Reductions*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (12 at this point) show the annual GHG emissions indexed to 1990 (base year) for the time period 2000-2011. The next column ("Regression")

shows the estimated slope parameter of a simple linear regression of the GHG emission index on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(GHG, Time) * s(GHG)}{s(GHG)}$$

In this formula, corr(GHG, Time) refers to the Pearson correlation coefficient between a Member State's GHG emissions index and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in emissions for the three periods 2000-2007 (pre-crisis), 2007-2011 (since crisis onset) and 2009-2011 (recovery). They contain the formula used by Eurostat for the annualized growth rate in GHG emissions. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right)$$

RENEW **Worksheet**

The spreadsheet titled "RENEW" contains the data for the Europe 2020 indicator *Share of Renewable Energy in Gross Final Energy Consumption*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (8 at this point) show the share of renewables in primary energy consumption for the period 2004-2011. The next column ("Regression") shows the estimated slope parameter of a simple linear regression of the indicator on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(RENEW, Time) * s(RENEW)}{s(RENEW)}$$

In this formula, corr(RENEW, Time) refers to the Pearson correlation coefficient between a Member State's share of renewable energy in primary energy consumption and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in renewable energy share for the three periods 2004-2007 (pre-crisis), 2007-2011 (since crisis onset) and 2009-2011 (recovery). They contain the formula used by Eurostat for the

annualized growth rate in renewable energy share. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right)$$

DROPOUT **Worksheet**

The spreadsheet titled "DROPOUT" contains the data for the Europe 2020 indicator *Early Leavers from Education and Training*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (13 at this point) show the percentage of early school leavers for the time period 2000-2012. The next column ("Regression") shows the estimated slope parameter of a simple linear regression of the GHG emission index on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(DROPOUT, Time) * s(DROPOUT)}{s(DROPOUT)}$$

In this formula, corr(DROPOUT, Time) refers to the Pearson correlation coefficient between a Member State's percentage of early school leavers and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in early school leavers for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate of early school leavers. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right)$$

TERTIARY **Worksheet**

The spreadsheet titled "TERTIARY" contains the data for the Europe 2020 indicator *Tertiary Educational Attainment in the Age Group 30-34*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the

EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (13 at this point) show the percentage of people aged 30-34 years with tertiary degrees for the time period 2000-2012. The next column ("Regression") shows the estimated slope parameter of a simple linear regression of the tertiary degree indicator on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(TERTIARY, Time) * s(TERTIARY)}{s(TERTIARY)}$$

In this formula, corr(TERTIARY, Time) refers to the Pearson correlation coefficient between a Member State's percentage of people aged 30-34 who hold tertiary degrees and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in tertiary degree holders among the 30-34 year olds for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate in tertiary degree holders. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right)$$

EMPLOY **Worksheet**

The spreadsheet titled "EMPLOY" contains the data for the Europe 2020 indicator *Employment Rate in the 20-64 Age Group*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (13 at this point) show the percentage of people aged 20-64 years that were in the labour force during the time period 2000-2012. The next column ("Regression") shows the estimated slope parameter of a simple linear regression of the employment level on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(EMPLOY, Time) * s(EMPLOY)}{s(EMPLOY)}$$

In this formula, corr(EMPLOY, Time) refers to the Pearson correlation coefficient between a Member State's percentage of people aged 20-64 who are employed and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in employment rate for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate in employment rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right)$$

***RD* Worksheet**

The spreadsheet titled "RD" contains the data for the Europe 2020 indicator *Gross Domestic Expenditure on R&D (GERD)*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (12 at this point) show the percentage of GDP spent on R&D for the time period 2000-2011. The next column ("Regression") shows the estimated slope parameter of a simple linear regression of GERD on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(RD, Time) * s(RD)}{s(RD)}$$

In this formula, corr(RD, Time) refers to the Pearson correlation coefficient between a Member State's GERD values and Time and s() refers to the standard deviation.

The next three columns are used to calculate the trend in employment rate for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate in R&D spending. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

ENEFF Worksheet

The spreadsheet titled "ENEFF" contains the data for the Europe 2020 indicator *Primary Energy Consumption*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (11 at this point) show primary energy consumption for the time period 2000-2010. The column "Regression" shows the estimated slope parameter of a simple linear regression of primary energy consumption on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(ENEFF, Time) * s(ENEFF)}{s(ENEFF)}$$

In this formula, corr(ENEFF, Time) refers to the Pearson correlation coefficient between a Member State's numbers primary energy consumption and Time and s() refers to the standard deviation.

The column titled "Change" calculates the current level of primary energy consumption between the baseline year of data available (2000) and the most recent year of data available (2010). Negative numbers indicate a reduction in primary energy consumption, zero indicates no net change, and positive numbers show a net increase in primary energy consumption. The "Notes" column shows the years for which the "Change" column was calculated.

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-2010 (since crisis onset) and 2009-2010 (recovery). They contain the formula used by Eurostat for the annualized growth rate for energy efficiency. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

POVRISK Worksheet

This spreadsheet contains the data for the Europe 2020 indicator *People at Risk of Poverty or Social Exclusion*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following

columns (9 at this point) show the number of people at risk of poverty and social exclusion for the time period 2004-2012. The next column "MRYA" shows the value for the most recent available year for each country. It is used to calculate the change in the number of people at risk of poverty compared to a selected baseline year (2005 was chosen because of its highest data availability). The "Regression" column shows the estimated slope parameter of a simple linear regression of the number of people at risk of poverty and social exclusion on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(POVRISK, Time) * s(POVRISK)}{s(POVRISK)}$$

In this formula, corr(POVRISK, Time) refers to the Pearson correlation coefficient between a Member State's number of people at risk of poverty and social exclusion and Time and s() refers to the standard deviation.

The column titled "Change" calculates the current level of reduction in the number of people at risk of poverty and social exclusion between the baseline year 2005 and the MRYA column. Negative numbers indicate a reduction in the number of people at risk of poverty and social exclusion, zero indicates no net change, and positive numbers show a net increase in people threatened by poverty and social exclusion. The "Notes" column shows the years for which the "Change" column was calculated.

The next three columns are used to calculate the trend in poverty numbers for the three periods 2005-2007 (pre-crisis), 2007-MRYA (since crisis onset) and 2009-MRYA (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

***MATDEP* Worksheet**

The spreadsheet titled "MATDEP" contains the data for the Europe 2020 indicator *Severely Materially Deprived People*. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (10 at this point) show the number of people that are

considered severely materially deprived for the time period 2003-2012. The column "Regression" shows the estimated slope parameter of a simple linear regression of the number of people suffering from severe material deprivation on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(MATDEP, Time) * s(MATDEP)}{s(MAPTDEP)}$$

In this formula, corr(MATDEP, Time) refers to the Pearson correlation coefficient between a Member State's numbers of people suffering from severe material deprivation and Time and s() refers to the standard deviation.

The column titled "Change" calculates the current level of reduction in the number of people experiencing material deprivation between the baseline year 2005 and the MRYA column. Negative numbers indicate a reduction in the number of people experiencing material deprivation, zero indicates no net change, and positive numbers show a net increase in people experiencing it. The "Notes" column shows the years for which the "Change" column was calculated.

The next three columns are used to calculate the trend in material deprivation for the three periods 2005-2007 (pre-crisis), 2007-MRYA (since crisis onset) and 2009-MRYA (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

***WORKINT* Worksheet**

The spreadsheet titled "WORKINT" contains the data for the Europe 2020 indicator People living in households with very low work intensity. It consists of a rectangular array that lists the 27 EU Member States by 2-letter code and the EU27 in the first column ("geo") and by official name in the second column ("geo_label"). The following columns (9 at this point) show the number of people that are living in households with very low work intensity for the time period 2004-2012.

The next column "MRYA" shows the value for the most recent available year for each country. It is used to calculate the change in the number of people living in households with very low work intensity compared to a selected baseline year (2005 was chosen because of its highest data availability). The "Regression" column shows the estimated slope parameter of a simple linear regression of the number of people living in very low work intensity households on time. It is calculated as follows:

$$\hat{\beta} = \frac{corr(WORKINT, Time) * s(WORKINT)}{s(WORKINT)}$$

In this formula, corr(WORKINT, Time) refers to the Pearson correlation coefficient between a Member State's number of people living in households with very low work intensity and Time and s() refers to the standard deviation.

The column titled "Change" calculates the current level of reduction in the number of people living in very low work intensity households between the baseline year 2005 and the MRYA column. Negative numbers indicate a reduction in the number of people living in very low work intensity households, zero indicates no net change, and positive numbers show a net increase in people living in very low work intensity households. The "Notes" column shows the years for which the "Change" column was calculated.

The next three columns are used to calculate the trend in these numbers for the three periods 2005-2007 (pre-crisis), 2007-MRYA (since crisis onset) and 2009-MRYA (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

Updates: Any updates of the data contained in these indicator worksheets can be made by inserting new columns for additional years that have become available and adjusting the formulae used to calculate the regressions, trends, and changes (energy efficiency, poverty indicators).

Additions: Additional indicators can be added by inserting a new worksheet, setting it up in the same format as the other indicator worksheets (i.e., rectangular format with countries in rows and years in columns).

Targets **Worksheet**

The spreadsheet titled "Targets" contains a rectangular array that shows the national targets that each of the 27 EU Member States have set for the Europe 2020 headline indicators. The Comment column contains notes on specific Member States' deviations from indicator and/or target definitions.

Cells filled with "NA" mean that the country did not specify a target for the respective indicator. Units are not shown for target values, but can be obtained from the "Data Source" worksheet.

Updates: Any updates of the targets contained in the worksheet can be made by updating the value(s).

Additions: Should new indicators be selected for Europe 2020, then a new column can be inserted in the Targets worksheet and the country targets be entered.

Matrix **Worksheet**

The spreadsheet with the title "Matrix" pulls the individual indicators together. It consists of a rectangular array that in its two left-most columns shows the codes and official names of the 27 EU Member States and the EU27. The columns to the right show three different aspects of the data for each of the Europe 2020 headline indicators, namely the:

- **Current value**, i.e., the value for the most recent available year. For the Poverty and Energy efficiency indicators the current value represents the change from the baseline year to most recent available year (which years this refer to is shown in the comment columns for these indicators). A negative value for these indicators indicates a positive improvement, while a positive values means that an increase in the poverty-related indicator or energy consumption has occurred.
- Trend assessments, i.e., the three trend values calculated for each indicator.
- **Distance-to-target (DTT) value**, i.e., an assessment of how far the current value is away from meeting the national indicator target.

Distance-to-target assessment: this assessment measures how far the current observation is from the national target set by a given Member State for a specific indicator. If the Member State has not set a target, the DTT is missing (NA). A DTT value of 80 means, that the country has progressed 80% of the way to the target. If the target has already been reached and even exceeded, the DTT is

capped at 100. If a country has actually moved away from the target for a given poverty indicator or the energy efficiency indicator, then the DTT value is set to zero.

The formulas used to calculate DTT are shown below:

For indicators, for which "smaller values are better":

$$DTT_{ij} = 100 - \frac{(x_{ij} - T_{ij}) * 100}{T_{ij}}$$

The subscripts i and j refer to country i and indicator j. T stands for target value. For indicators, for which "larger values are better":

$$DTT_{ij} = \frac{x_{ij} * 100}{T_{ij}}$$

The poverty dimension of the Europe 2020 Strategy is expressed through several indicators: people at risk of poverty and social exclusion, people affected by severe material deprivation, and people living in households with very low work intensity. Most Member States have specified their poverty alleviation goals by choosing one of these three indicators. The DTT values reflect this by showing NAs for the indicators that were not chosen by a Member State and hence have no set target.

As the The DTT calculations show, the formulas use two types of information: (a) the observed values (x_{ij}) and the targets (T_{ij}). The latter are pulled from another spreadsheet titled "Targets".

		GHG Emission (1990=100)					Renewable Energy (% of total)				
geo	geo_label	Current Value	Trend 2000-2007 (pre-crisis)	Trend 2007-MRYA (since crisis onset)	Trend 2009-MRYA (post-crisis)	DTT	Current Value	Trend 2004-2007 (pre-crisis)	Trend 2007-MRYA (since crisis onset)	Trend 2009-MRYA (post-crisis)	DTT
EU27	EU27	83.03	neutral	decreasing	neutral	96.2	13	increasing	increasing	increasing	65.0
BE	Belgium	85.12	decreasing	decreasing	decreasing	99.9	4.1	increasing	increasing	decreasing	31.5
BG	Bulgaria	60.45	increasing	neutral	increasing	149.6	13.8	neutral	increasing	increasing	86.3
CZ	Czech Repub	68.42	neutral	decreasing	neutral	137.2	9.4	increasing	increasing	increasing	72.3
DK	Denmark	83.39	neutral	decreasing	decreasing	95.8	23.1	increasing	increasing	increasing	77.0
DE	Germany	74.48	neutral	decreasing	neutral	113.4	12.3	increasing	increasing	increasing	68.3

Updates: The Matrix worksheets links to input tables as specified above. Thus, any updates in the underlying data, targets and time trends will automatically be reflected in the worksheet.

Additions: Should new indicator(s) be added to the Europe 2020 indicators, then this worksheet needs to be expanded by inserting the columns for Current Value, Time Trends, and DTT value together with the corresponding reference formulae.

NPI **Worksheet**

The spreadsheet titled "NPI" shows the calculated National Progress composite indicator and shows for each of the 27 Member States and the EU27 as a whole, how much – on average – they are away from meeting all of their national targets. In a rectangular array that shows in its first two columns the codes and official names of the 27 Member States and the EU27, the spreadsheet shows the DTT values for each indicator, the average DTT value, the country's rank, as well as the average DTT values for the three pillars of the Europe 2020 Strategy, namely the smart growth, sustainability and inclusion pillars.

DTT values: the DTT values are pulled directly from the spreadsheet titled "Matrix". They are interpreted as follows: a value of 100 means that the target has been achieved (or even exceeded), a value of 80 means that the target has been 80% achieved, and a value of zero means that no or even counter-directional progress has been made.

Average DTT value: this measures the simple arithmetic average of the eight headline indicators. Its maximum possible value is 100, which would mean that the country or EU27 has reached or exceeded all targets. The minimum value is zero.

Rank: this column shows the rank order of countries and the EU27 according to the Average DTT value. The higher the average DTT value, the lower the rank number, i.e., the best performing country has rank 1 and the worst performing country has rank 27 (ties are unlikely to occur due to the relatively large number of indicators).

Average Sustainability DTT value: this column shows the average DTT value for only the sustainability-related indicators, i.e., GHG emissions, Renewable energy share and Energy efficiency.

Average Smart Growth DTT value: this column shows the average DTT value for only the growth-related indicators, i.e., Tertiary degree holders and R&D spending.

Average Inclusion DTT value: this column shows the average DTT value for only the inclusion indicators, i.e., Early school leavers, Employment rate and Poverty and social exclusion.

Updates: The NPI worksheets links to input tables as specified above. Thus, any updates in the underlying data, targets and time trends will automatically be reflected in the worksheet.

Additions: Should new indicator(s) be added to the Europe 2020 indicators, then this worksheet needs to be expanded by inserting the columns for new indicator(s) DTT value. In addition, the formulae for calculating the average DTT value (NPI) and the sub-components need to be adjusted.

Remaining Worksheets

The remaining worksheets contain a collection of charts and tables presented in this report. They are not required to perform the NPI calculation and are supplementary. The input values underlying these charts are sometimes automatically updated, but in some cases need to be updated manually, i.e., by copying them from the relevant data worksheet.

10.1.2 Worksheets in the NUTS2 database

The first spreadsheet is titled "DataSources". It consists of 8 columns. These columns provide information about the origin of the data used in the calculations, when the data were obtained (downloaded) and where from. Specifically, this spreadsheet provides the following information.

Column	Information
Tab Name	Which spreadsheet does the information provided here refer to. Each tab refers to one unique data set.
Data file code	This is the code used internally by the contractor to refer to the data set specified in Tab Name.
Indicator	Name of the indicator as specified by the original data provider.
UNIT	Unit of measurement of the indicator as specified by the original data provider.
Source of Data:	Original data provider.
Last update:	Date that the data were updated by the original data provider for the last time.
Date of extraction:	Date that the data were obtained (downloaded) by the contractor.
Hyperlink to the table:	Link to the location from which the data set was obtained (downloaded). This might not be a website maintained by the original data source (e.g., EEA is the original data provider but the data file was obtained from Eurostat).

NUTS2 **Worksheet**

This worksheet contains the most recent revision of the NUTS2 classification. It is for reference purposes only and should be updated as a new NUTS2 revision becomes available. If and when such a revision is released, then all following worksheets require an update of the NUTS2 codes and labels as well.

Reqpop **Worksheet**

This worksheet contains the NUTS2 population figures for all NUTS2 regions and the years 2000-2011. The figures are required to apportion the targets for the poverty indicators to the NUTS2 regions. If new or updated statistics become available, then this table should be revised accordingly, i.e., by adding new columns or revising the existing statistics.

Natpop **Worksheet**

This worksheet contains the NUTS0 population figures for all NUTS0 regions and the years 2000-2012. The figures are required to apportion the targets for the poverty indicators to the NUTS2 regions. If new or updated statistics become available, then this table should be revised accordingly, i.e., by adding new columns or revising the existing statistics.

Renew **Worksheet**

The spreadsheet titled "renew" contains the data for the Europe 2020 indicator *Share of Renewable Energy in Gross Final Energy Consumption*. It consists of a rectangular array that lists the 272 NUTS2 regions by code in the first column ("geo"). The following columns (13 at this point) show the share of renewables in primary energy consumption for the period 2000-2012. The next column ("MRYA") shows the most recent year available, which is used to calculate the DTT value in the spreadsheet "Matrix".

Tertiary **Worksheet**

The spreadsheet titled "tertiary" contains the data for the Europe 2020 indicator *Persons aged 30-34 with Tertiary Education Attainment*. It consists of a rectangular array that lists the 272 NUTS2 regions by code in the first column ("geo"). The following columns (13 at this point) show the percent of persons aged 30-34 with tertiary education attainment for the period 2000-2012. The next column ("MRYA") shows the most recent available year and contains the value for the most recent year that a region has data available, respectively. It is used to obtain the current value in the spreadsheet "Matrix".

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-MRYA (since crisis onset) and 2009-MRYA (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

Employ **Worksheet**

The spreadsheet titled "employ" contains the data for the Europe 2020 indicator *Employment Rate of the Age Group 20-64*. It consists of a rectangular array that lists the 272 NUTS2 regions by code in the first column ("geo"). The following columns (12 at this point) show the employment rate of the age group 20-64 for the period 2000-2012. The next column ("MRYA") shows the most recent available year and contains the value for the most recent year that a region has data available, respectively. It is used to obtain the current value in the spreadsheet "Matrix".

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-MRYA (since crisis onset) and 2009-MRYA (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

RD **Worksheet**

The spreadsheet titled "RD" contains the data for the Europe 2020 indicator *Total intramural R&D expenditure (GERD) as percent of GDP*. It consists of a rectangular array that lists the 272 NUTS2 regions by code in the first column ("geo"). The following columns (13 at this point) show the Total intramural R&D expenditure (GERD) for the period 2000-2012. The column titled "MRYA" stands for most recent available year and contains the value for the most recent year that a region has data available, respectively. It is used to obtain the current value in the spreadsheet "Matrix".

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

Povrisk **Worksheet**

The spreadsheet titled "povrisk" contains the data for the Europe 2020 indicator *At Risk of Poverty*. It consists of a rectangular array that lists the 268 NUTS 2 regions by code in the first column ("geo"). The following columns (13 at this point) show the number of people at risk of poverty for the period 2000-2012. The column titled "MRYA" stands for most recent available year and contains the value for the most recent year that a region has data available, respectively. It is used to obtain the current value in the spreadsheet "Matrix".

The column titled “Difference 2008-MRYA” calculates the differences between the most recent available data point and the 2008 data point, the latter having been chosen for its data coverage as the baseline reference year. This means that negative values correspond to a reduction in the number of people at risk of poverty, zero means no change and positive value show that more people are now at risk of poverty compared to the reference year.

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

Dropout **Worksheet**

The spreadsheet titled “dropout” contains the data for the Europe 2020 indicator *Early School Leavers*. It consists of a rectangular array that lists the 272 NUTS2 regions by code in the first column (“geo”). The following columns (13 at this point) show the early school leaver rate for the period 2000-2012. The column titled “MRYA” stands for most recent available year and contains the value for the most recent year that a region has data available, respectively. It is used to obtain the current value in the spreadsheet “Matrix”.

The next three columns are used to calculate the trend in these numbers for the three periods 2000-2007 (pre-crisis), 2007-2012 (since crisis onset) and 2009-2012 (recovery). They contain the formula used by Eurostat for the annualized growth rate. If the trend value is greater than 0.01, it is considered to be significantly increasing, if it is less than -0.01, it is considered to be significantly decreasing. Values in between -0.01 and 0.01 are considered to be indeterminate.

$$trend = \left(\frac{x_{yeari}}{x_{baselineyear}} \right) \wedge \left(\frac{1}{(year_i - baselineyear)} \right).$$

Updates: Any updates of the data contained in these indicator worksheets can be made by inserting new columns for additional years that have become available and adjusting the formulae used to calculate the trends and MRYA.

Additions: Additional indicators can be added by inserting a new worksheet, setting it up in the same format as the other indicator worksheets (i.e., rectangular format with regions in rows and years in columns).

***RPI DTT* Worksheet**

The spreadsheet with the title "RPI DTT" pulls the indicator data together to calculate the DTT values. It is a rectangular array consisting of the NUTS2 region code, its label and the NUTS0 country code. The next sets of three columns show for each indicator the MRYA, the associated target and the DTT value.

This worksheet is the input to the final RPI worksheet.

Updates: Any updates of the data contained in this worksheet should appear automatically as the data in the underlying (linked) indicator worksheets are updated.

Additions: If new indicators are added to the Europe 2020 indicators, then this worksheet can be updated by including three additional columns per newly added indicator and entering the appropriate reference formulae to the indicator worksheets.

***RPI DTT FINAL* Worksheet**

This worksheet links to the RPI DTT worksheet and provides the finalized indicator DTT values by limiting the DTT values to the interval 0 to 100. It automatically updates to the information shown in the RPI DTT Worksheet.

Updates: Any updates of the data contained in this worksheet should appear automatically as the data in the linked RPI DTT worksheet are updated.

Additions: If new indicators are added to the Europe 2020 indicators, then this worksheet can be updated by including one additional column per newly added indicator and entering the appropriate reference formulae to the RPI DTT worksheet.

MAPS Worksheet

This worksheet contains the input data for the map-making software.

Updates: If any changes were made to the underlying data, this worksheet needs to be updated manually by copying in the new data.

RegionalProgress Worksheet

This worksheet pulls together the trend values for each indicator and each of the three trend assessment periods (pre-crisis, crisis-onset, recovery).

It then evaluates these values in terms of their significance according to the Eurostat rule, i.e., trends that are greater than 0.01 in absolute terms are considered to be significant.

Updates: Any updates of the data linked to in this worksheet should appear automatically.

Additions: If new indicators are added to the Europe 2020 indicators, then this worksheet can be updated by including one additional columns per newly added indicator and entering the appropriate reference formulae to the newly added indicators' trend values.

Remaining Worksheets

The remaining worksheets contain a collection of charts and tables presented in this report. They are not required to perform the RPI calculations and are supplementary. The input values underlying these charts are sometimes automatically updated, but in some cases need to be updated manually, i.e., by copying them from the relevant data worksheet.

11. Looking ahead

This report presents work in progress. As the data basis for monitoring and evaluating progress towards the Europe 2020 Strategy's goals and targets grows and improves, it will be possible to examine sub-national progress in more timely and finer detail. At present data limitations hinder the kind of in-depth analysis that is already possible at national level (albeit noting that the time horizon is still too short and new to allow a progress assessment).

Despite these data gaps it is possible to develop an analytical framework for aggregating and comparing the Europe 2020 indicators at the regional level and it should be possible to link it to actions aimed at speeding up or re-directing policies such that the set goals can be achieved. In particular, the presented national and regional progress indicators can be used to assist the work of the CoR in at least three aspects:

- Monitor and evaluate the implementation of the Europe 2020 Strategy at regional level
- Facilitate comparisons across regions for the purpose of identifying approaches and policies that have shown proven results and that may be transferable to other regions.
- Provide a fact-based, quantitative basis for identifying best practices and knowledge that can be shared among the regions as well as identify problem areas that may require new or more differentiated approaches to lead to the successful completion of the Europe 2020 Strategy.

From analytical and statistical perspectives, it might be possible to improve the data basis, although it should be carefully evaluated whether the potential gains outweigh the additional uncertainty they might introduce. For example, gap-filling procedures should be reviewed in terms of their applicability given the data and breaking national targets down to the regional level requires a thorough knowledge and understanding of the local contexts to be meaningful and defensible.

The trend analysis conducted here is based on simple time-series regression. Due to the volatility in some data series as a result of the economic crisis, this regression model may yield misleading results and could be replaced by a more sophisticated and appropriate regression model.

Annex I – Data Sets

Tab Name	Data file code	Indicator	UNIT	Coverage	Source of Data:	Last update:
GHG	t2020_30	Greenhouse gas emissions, base year 1990	index	2000-2011	EEA	29.08.2013
RENEW	t2020_31	Share of renewable energy in gross final energy consumption	%	2004-2011	Eurostat	13.08.2013
DROPOUT	tsdsc410	Early leavers from education and training by sex	%	2000-2012	Eurostat	13.08.2013
TERTIARY	edat_lfse_07	Tertiary educational attainment by sex, age group 30-34	%	2000-2012	Eurostat	13.08.2013
EMPLOY	t2020_10	Employment rate by sex, age group 20-64	%	2000-2012	Eurostat	13.08.2013
RD	t2020_20	Gross domestic expenditure on R&D (GERD)	% of GDP	2000-2011	Eurostat	27.08.2013
POVRISK	t2020_50	People at risk of poverty or social exclusion	1000 persons	2004-2012	Eurostat	27.08.2013
MATDEP	t2020_53	Severely materially deprived people	1000 persons	2004-2012	Eurostat	27.08.2013
WORKINT	t2020_51	People living in households with very low work intensity	1000 persons	2004-2012	Eurostat	27.08.2013
ENEFF	t2020_33	Primary energy consumption	1000 toe	2000-2010	Eurostat	27.08.2013