1. Setting R&D targets

1) National R&D intensity targets. Does your country have R&D intensity target(s) at the national level (e.g. gross domestic expenditure on R&D as % of GDP; business expenditure on R&D as % of GDP)? If so, please specify:

The Netherlands set a national target of 2.5% of GDP spent on R&D by 2020, with no subdivision in specific goals as private R&D expenditures. The target was set as a consequence of the Lisbon Strategy. While the Lisbon-strategy choose a target of 3% for the whole EU, the Netherlands choose for a R&D target of 2.5% due to sector structure (see the National Reform Programme 2011).

2) Target changes. Have the targets changed over time? If so, please specify:

The current target was set in 2010. Since then, it’s not been changing. While the target has been set with a deadline a number of times, these deadlines eventually have been postponed a number of times.

Originally, the Netherlands adhered to the 3% target that was set in the whole EU in the framework of the Lisbon Strategy. When further investigating the results of the Dutch R&D-intensity, the negative effects of the Dutch sector structure were already mentioned, but not taken into account in the formal R&D-target, which was still set at 3%. In 2010, documentations was available which set the R&D-intensity level at 2.5%.

3) Subnational targets. Does your country have R&D intensity targets at the regional, local and/or sectoral level? If so, please provide an exhaustive list specifying the.

Such do not exist, although some provinces or regions of the Netherlands have set targets (such as being one of the most innovative regions in Europe). Brabant (of which Eindhoven is a major city) has set goals to be in the top-10 most innovative regions in Europa, according to its Economic Strategy. Other regions might use such targets as well, but have not stated them formally in their policy agenda’s.

The absence of targets on this point might have to do with a few things. First, region’s don’t have the instruments or budget to pursue ambitious R&D-projects only by themselves, while they do play an important role in facilitating innovation, for example by easing access to

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1 Ministry of Economic Affairs and Climate Policy, The Netherlands
2 Ministry of Economic Affairs and Climate Policy, The Netherlands
finance. Second, it reflects the limited attention in the Netherlands for R&D-intensity goals. For policymakers, reachable goals such as creating top local innovation ecosystems can be more visible targets.

4) **Target criteria.** What were the criteria used to determine the specific target(s) in your country?

The target was based on the target set at EU level (i.e. 3% of GDP spent on R&D). However, given that the Netherlands have a strong service sector, the target was not set on 3%, but on 2.5%. This target also has been used by the European Commission when it comes to checking the Netherlands on the reaching of this target, for instance in the European semester.

5) **The indicator.** To what extent do you think that R&D intensity provides a good indicator of innovation activity in your country? (please specify why)

Somewhat disagree.

Despite scoring below countries such as Germany or the Scandinavian countries, there are a number of reasons why the innovativeness of the Netherlands is larger than measured in the 2.5% target. The European Commission, for instance, mentions in its latest country report of the Netherlands the intangible investments, which could be a proxy for innovativeness. Furthermore, the Netherlands consistently scores high in the European Innovation Scoreboard and the World Competitiveness Index.

6) **Indicator challenges.** What have you found to be the main issues of using R&D to measure business-led innovation in your country? (select among the options below and provide references to quantitative and qualitative evidence where possible)

**R&D is concentrated in a small number of firms, sectors and/or regions but the aggregate R&D measure does not capture this trend.**

There are number of different reasons for relatively low levels of R&D intensity, one of them is sector structure. It also has a large service sector, for instance, the Netherlands has a large financial sector. The Netherlands are in a top knowledge position when it comes to a number of sectors (including agriculture and semiconductors; see for instance the relevance of companies like ASML and RijnZwaan). However, given the relatively small importance of this sector for the aggregate GDP, R&D intensity remains under the target intensity.

Reflecting on the thesis above, the sound position of these sectors is not reflected well in R&D-intensity levels, but do show a certain measure of innovativeness: the ability to host innovation ecosystems, from university to startup and scale-up.

**Global firms with operations in the country are relying on their R&D activities in other countries or conduct their R&D abroad.**

A number of reports note that Dutch firms invest elsewhere in R&D, but this is not compensated completely by foreign firms investing in doing R&D in the Netherlands (see the recent report of the Rathenau Institute below). This obviously is related to general reasons why R&D in the Netherlands is below policy targets (such as absence of a sufficient amount of educated employees), but also shows that Dutch companies are innovative, however do not invest enough in the Netherlands.

The recent report of the Rathenau Institute concludes, based on qualitative research, that companies do not tend to relocate existing labs in the Netherlands – or Europe in general – but do invest in the development of new products in locations close to supply chains and markets. This could have negative effects for both the sector structure and the sector R&D-
intensity, assuming that companies maintain headquarters, with administrative tasks, in the Netherlands, but do not intensify R&D-activities in the Netherlands.

**R&D does not sufficiently capture broader innovation activities such as the costs of commercialising solutions and scaling up production that are important to your country.**

*Service innovation is not captured by indicators that are readily available.*

The strongly digitalized Dutch economy, in combination with solid investments in intangible assets, are a sign of innovativeness. When intangible investments are taken into account, the Netherlands scores relatively good – just as Sweden and the US, who are, just as the Netherlands, on top of global competitiveness and innovation rankings.

7) **Other targets.** Do your innovation strategies or other strategic documents include other quantitative targets to foster innovation? If so, please provide details on the specific targets and year of adoption, deadlines to achieve them and documents setting them.

As a goal of “the Top sector policy approach”, top sectors (both public and private partners) should participate for at least EUR 800 million, of which at least 40% should be private contribution. This goal has been achieved in 2015, with more than EUR 1 billion investments, with almost 50% private contributions. The goal was originally set at EUR 500 million, but adjusted quickly to EUR 800 million. ³

Furthermore, one of the goals of “the Top sector policy” is to be in the top-5 of most competitive economies in both the European Innovation Scoreboard (EIS) and World Competitiveness Report (WCR), of which the EIS also uses the number of patents as measure. This has been achieved. In that sense, number of patents are also being used as a target.

### 2. Implementing R&D targets and policies

8) **Policy initiatives in place.** What are the main policy initiatives implemented in your country with the aim of achieving the national R&D target(s)? For each policy initiative, please provide the following details:

Not specified.

9) **Successful policies.** What policies have been most successful (currently or in the past) in driving R&D intensity? What are considered the main factors of success? (These may be a mix of policy and other contextual factors). Please provide qualitative and quantitative

Not specified

10) **Unsuccessful policies.** Are there any examples of policies implemented in the past in your country to drive R&D intensity that did not reach the intended objectives? (e.g. investments that did not steer as much private investment in R&D as expected) What were the factors that hindered their success? (These may be a mix of policy and other contextual factors). Please provide qualitative and quantitative evidence when possible.

Although all policy instruments have been evaluated and show a good performance when it comes to increasing R&D, there is no overarching view on how these instruments play a role in the wide objective of increasing R&D intensity. For instance, the effectiveness of the Patent Box (Innovatiebox), which does not target directly R&D expenditures but instead improves the business climate, has been in doubt. One of the side effects is a perceived inequality

³ The Top Sectors are: Horticulture and propagation materials; Agri-food; Water; Life sciences and health; Chemicals; High tech; Energy; Logistics; Creative industries. See for more information [here](#).
between young firms and existing, often larger, firms. The Innovation Box, as other patent boxes, offers lower profit taxes for profit that has been made with innovative products (projects that received WBSO, a tax credit for R&D-projects, provide a check if firms invest in R&D). The Innovation Box thus is not a stimulus for doing R&D itself, but rather incentivised firms to maximize the profit they are making from R&D-projects.

It could be very possible that R&D subsidies could be invested more efficiently, having in mind the target of increasing R&D intensity as a whole.

Furthermore, even though the Netherlands have policies that create demand-pull, such as innovation vouchers (in the MIT (Stimulation SME-innovation in Topsectors), and the Small Business Innovation Research (SBIR), these are quite limited instruments in budget, as compared to budgets available for fiscal stimulation. In the SBIR, governments challenge SMEs to bring up solutions for societal challenges they are facing. It ultimately can lead to having the government as a customer.

11) **Implementation challenges.** What have been the main challenges when implementing policies aimed at increasing R&D performance? Please provide details.

One of the main issues in Dutch innovation policy is a new focus on missions in its mission-oriented innovation policy. This brings two problems with implementation: first making choices on the extent and size of these missions, and second the relationship between missions and R&D-intensity. Given that the missions address societal challenges, their primary objective is not to increase R&D but rather to find solutions for these missions. This should primarily lead to knowledge and business and does not focus on the size of R&D-investments.

12) **The role of policy and other factors.** To what extent was the evolution of R&D performance in your country driven by policy or by other contextual factors? Please provide details and quantitative evidence where possible, and specifying which factors particularly supported or hindered R&D investments. Please also refer to any evaluation conducted to assess the impact of policy instruments on R&D intensity.

On the one side, most R&D-policy initiatives are evaluated on their target of increasing R&D-investments (and with that R&D-intensity). On the other side, these policy initiatives are not evaluated on their role in the holistic approach of increasing R&D-intensity. Given that such a holistic approach, with a dedicated and quantitative analysis of what is needed to overcome obstacles in reaching the R&D-intensity target, is missing, it is hard to measure exactly if R&D-policy initiatives reach their objectives.

There are indications that the low number of Dutch STEM-graduates play a role, but this has not been investigated.

13) **Policy lessons.** What are the main policy lessons learned during the implementation of policies for increasing R&D intensity? What would be your concrete advice to countries intending to set R&D targets and policies to achieve them for the first time? (e.g. high or low effectiveness of specific policy measures, how to take into account specific country conditions)

I believe the Netherlands have made good steps in evaluating existing policies and that these evaluations are used, if possible, to improve the functioning of these policies. However, while these policies are individually well suited to improve innovation performance, there has not yet been a good analysis of how R&D-intensity in the Netherlands could be improved to 2.5 or 3% and what problems should be solved.

R&D targets and innovation disparities
14) **Innovation disparities.** Which distributional aspects (i.e. Social, sectoral and/or geographical disparities) has received more innovation policy attention in your country? What evidence are you using to explore the geographical and sectoral distribution of R&D performance in your country? Please provide the reference and link to that evidence where possible.

There are number of different reasons for relatively low levels of R&D intensity, one of them is the sector structure. The OECD analysis (2015) found that sector structure accounted for 79% percent of the difference in R&D expenditures between the OECD average and the Netherlands, with a number even higher in the past.

It seems that the role of sector structures for the Netherlands has decreased between 2009 and 2015, mostly due to lower R&D-intensities within sectors. Indeed, following the beginning of “the Top sector policy”, the clusters and sectors within that system have received slightly more attention than other sectors. Given that there are only few sectors not within the Top sector policy, this has almost no consequences for sectors that are already R&D-intensive (they are all in the Top sector policy). It might, however, be harder for ‘new’ R&D-sectors that have no connection with the ‘usual’ Top sectors, to be included in the Top sectors policy and the network if offers. This includes for instance AI and quantum-related industries (however, their current size is not too large).

One of the reasons for the relatively low amount of R&D-intensive sectors might be that the number of tertiary graduates in science, ICT and engineering is persistently among the lowest in Europe. The Netherlands perform much below the level of known R&D-top countries, such as Germany and Korea. The relative negative sector structure could also be explained by little incoming foreign R&D-investments.

15) **Territorial disparities.** Are territorial inequalities in innovation performance explicitly addressed by policies discussed in question 8 or other policies aimed at improving R&D performance? (e.g. measures to promote the distribution of R&D expenditures across regions; measures targeted at less innovative regions) Please explain how these policies promote inclusiveness and provide quantitative evidence of results/impacts achieved where available.

Territorial disparities are not really being taken into account. While they may be part of the Regio-deals and European Fund for Regional Development, there is no formal regional innovation policy. While universities and applied research institutes are distributed quite evenly across the country, R&D expenditures for private firms are not (being concentrated in the south and western parts of the country).

16) **Sectoral disparities.** Are sectoral disparities in innovation performance explicitly addressed by policies discussed in question 8 or other policies aimed at improving R&D performance? Please explain how these policies promote inclusiveness and provide quantitative evidence of results/impacts achieved where available.

Sectoral disparities are not considered in the R&D-intensity target in the Netherlands. Given the broad number of sectors that are being represented in the Topsector Policy, the Topsector policy is not suited to do sectoral policies. On the other hand, as the Topsector policy mainly takes into account existing sectors, building up new R&D-intensive sectors is not part of this policy. This policy gained a new mission-driven approach that could stimulate investments around specific missions and thus in ‘new’ sectors.

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4 See, for instance: [https://www.oecd.org/cfe/_The%20Netherlands.pdf](https://www.oecd.org/cfe/_The%20Netherlands.pdf)
Given the generic character of the Dutch innovation policy, it would be hard to

17) **Other country characteristics.** How are other specific characteristics of the country (e.g. sectoral structure, R&D strengths) taken into account when designing innovation policies aimed at improving R&D performance?

Sectoral strengths are taken into account when designing new innovation policies. Given that the Netherlands are a small open economy, investments are primarily targeted –if targeting is possible– at those areas where the Netherlands have the expertise to find solutions for societal challenges, have comparative advantages and belong to the technological frontier. As outlined above, these sectors include Agro and Food, High-tech (including Semiconductors and Health) and Water-related technologies.

4. R&D targets in the digital age

18) **Policy strategies.** Do current R&D and innovation policy debates and/or policy strategies in your country address the opportunities and challenges of digital and AI-driven innovation? Please provide details regarding current debates in your country or how those have been integrated in innovation strategies.

They do not include these goals as such.

19) **Policy initiatives.** Have specific policy initiatives to foster R&D been created or adjusted in view of changes in research and innovation practices brought about by digital technologies? Please provide details of those changes, making reference to the specific policies concerned.

There are action plans for digital and AI-related growth, but these do not encompass the transformation of traditional R&D.

20) **New targets.** Do the abovementioned digital/AI-related innovation strategies or initiatives include quantitative targets? If so, please provide details on the specific targets and years of adoption, deadlines to achieve them and documents setting them.