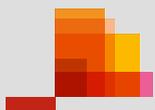
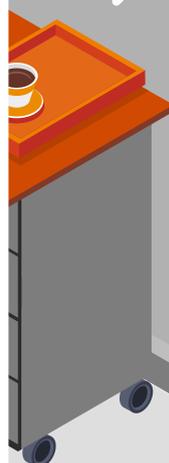




# The costs and benefits of working from home



**pwc**

# Introduction



Working from home was not an unusual thing in our firm, just as it was normal to work on assignments from a client site. There were many days when the floors of our own office buildings were not fully occupied. And then, suddenly, brought on by COVID-19, we were all working from home without exceptions and for a longer period. And this turned out to be quite a different situation.

We quickly found out that a combination of human flexibility, adaptability and dedication, supported by an up-to-date technological infrastructure helped us face the new challenges of fully remote working. Albeit in a different way, we got our work done. We got acquainted with each other in new ways, because we got to have a look into our colleagues' home situation. We saw spouses, children and other personal peculiarities during our online meetings. We also noticed that working from home impacts people in different ways depending on the circumstances at home but also on a person's character and preferences. From our weekly well-being survey we learned that a lot of our people could easily do without the daily commute, but that they missed the daily physical contacts with colleagues and clients.

This is a time that tests our resilience as individuals and thus as a firm. But also our culture and the ability to seek connections. It is about flexibility, changing perspectives and embracing the unknown. I am proud and impressed by the extent to which we succeeded in this time of crisis. Now we are carefully restarting office life, and the challenge is to hold on to all good things that came from the massive change in the way we worked in the past months. I do not envisage that we will return to pre-COVID office life completely. We need to rethink the way we work and look at all aspects of working and reconfigure them into a 'new normal'.

With this research we want to support the choices organisations and their people make in the way they (re)design their way of working. We also want to contribute to the broader societal debate on the implications of an increase in working from home, as this redesign has implications for society at large. Our research on the costs and benefits of working from home highlights the substantial benefits of an increase in working from home in terms of both cost savings and emission reductions. However, it also outlines negative, non-quantifiable impacts

that can be easily overlooked. These relate to the absence of proximity to other people and the influence that may have on working together, innovation and company culture.

Looking ahead, finding the right balance and not losing momentum to ignite transformation are key challenges. Let this document support you in this process.

## **Marc Borggreven**

Member of the Board of PwC in the Netherlands and responsible for Human Capital

# How does an increase in working from home change societal welfare and who stands to benefit most from it?

In 2019, 39 percent of all workers in the Netherlands worked (usually or incidentally) from home. In this year, eight out of ten companies with more than ten workers facilitated teleworking. This number jumps to more than nine out of ten companies when it comes to those that employ more than 50 people. These numbers that were published at the beginning of 2020 by CBS suggest that the potential of working from home, which was already large pre-COVID-19, is probably bigger than we previously thought.

The current pandemic forced a lot of workers (including the self employed) to work from home. While this situation is expected to continue given the scarcity of office space in a one and a half meters society, the lingering question is whether a permanent increase in working from home will occur post-pandemic. Therefore, we set out to research how – in terms of costs and benefits – a permanent increase in working from home would influence overall societal welfare.

Our analysis takes into account both quantifiable and non-quantifiable considerations. We found that the net benefit of increasing the time worked from home by just one day per week amounts to € 3.9

billion annually, primarily driven by cost savings to companies and employees. This translates to a reduction of 1 percent of total wagebill in the Netherlands. Additionally, this change could bring about a reduction in CO<sub>2</sub> emissions of 605.5 million kgs per year, from less (commuting) traffic. This translates to a reduction of 2 percent of total emissions from road transport in the Netherlands. We also considered non-quantifiable, ‘softer’, impacts such as those related to company culture, collaboration, innovation, and health.

Our main finding is that while an increase in working from home is beneficial from a direct cost and emission perspective, in the longer term the results are not so straight-forward. The value of cooperation, knowledge-sharing, and innovation are considered fundamental to the success of organisations. These values depend on proximity to one another and may come under pressure in a ‘new normal’ scenario.

We have seen that working from home during the pandemic went very well in general. Benefiting from the highly developed digital infrastructure, a lot of work continued seamlessly. This probably explains the positive vibe around it and the



debate about the new normal. Why return to the office at all when we can avoid the traffic? It explains why organisations are seriously thinking about changing their way of working permanently.

When the pandemic ends, and working from home will be a choice of employers of employees rather than forced, both

parties should also take into account the less positive effects of working from a distance. Precisely because aspects such as innovation or corporate culture are not easy to quantify or find evidence for, they run the risk of being overlooked. The challenge is to find the best combination of both worlds.

### The assumption: working one day extra from home

The first question of course is, how much can we work from home? This differs by the type of work one does, with knowledge workers and workers in “management, business and financial” occupations being most likely to be able to do so. Surveys conducted by PwC and Global Workplace Analytics<sup>1</sup> indicate that on an average approximately 50 percent of the total workforce of a country is able to work from home. This is not unfathomable, as around 39 percent of the Dutch already reported working from home at least sometimes<sup>2</sup>.

The assumption that underlies our analysis is that:

- the part of the workforce that is able to work from home (fifty percent) of the total workforce will work from home one additional day per week. This would mean an increase of twenty percent (1 out of 5 days a week) for half of the workforce. Implementing this has limited cost implications, as most of these workers already have the tools they need to work from home;

- the days that are worked from home are optimally spread over the week, meaning that the impact we calculate is the maximum impact<sup>3</sup>.

### Impact on four impact categories: employers, employees, environment and public goods

In this analysis, we have assessed the net impact of the one-day-per-week increase in working from home on four areas: employers, employees, the environment, and other public goods. We included both quantifiable and non-quantifiable effects, and both direct and indirect effects on each of these four impact categories.

The impact analysis points at a net increase in social welfare. The net increase is calculated as the difference between the welfare of our assumed scenario of a post-COVID-19 increase in working from home and the welfare of the status quo (pre-COVID-19). The analysis shows that the benefits to employees (health and overall wellbeing), the environment, and public goods are clearly positive, while the benefits to employers are more nuanced. They benefit on some direct

cost aspects but can be negatively affected by other softer/non-quantifiable effects such as a weaker corporate culture or less innovation.

The analysis is quantified as much as possible, with a few impact areas being discussed only qualitatively. The distribution of the net societal benefit is also considered solely qualitatively.

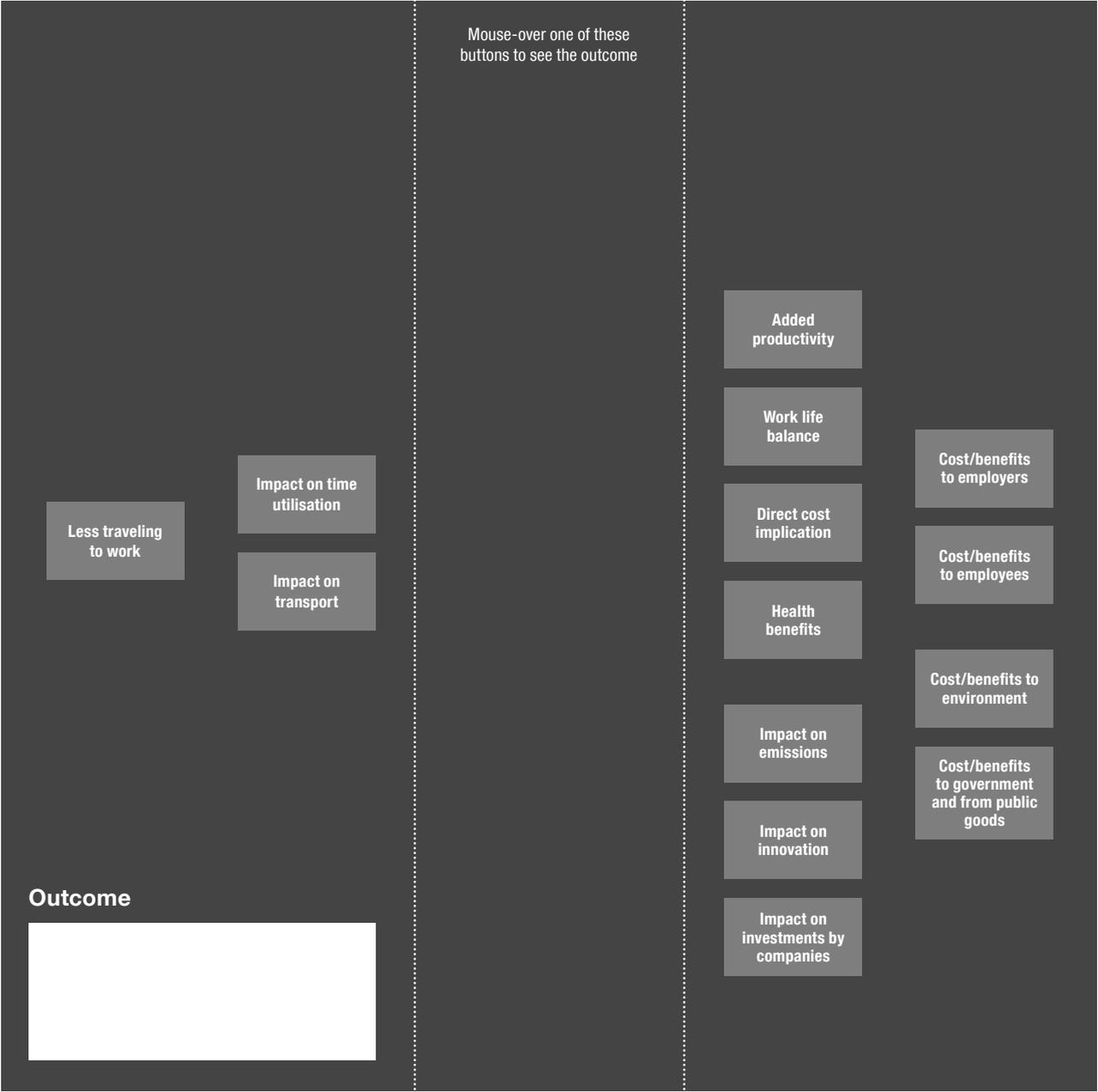
	Calculation	Cost / Benefit in millions
Office space	m <sup>2</sup> reduction: 8,700,000 m <sup>2</sup> price: 125	€ 1,087.5
Gas	m <sup>3</sup> reduction: 95,500,000 m <sup>3</sup> price: 0.77	€ 73.5
Electricity	kWh reduction: 780,000,000 kWh price: 0.2225	€ 173.6
Catering	Total size in millions: 3,468	€ 346.8
<b>Total</b>		<b>€ 1,681.4</b>

<sup>1</sup> Global Workplace Analytics, 2020, <https://globalworkplaceanalytics.com/how-many-people-could-work-from-home>

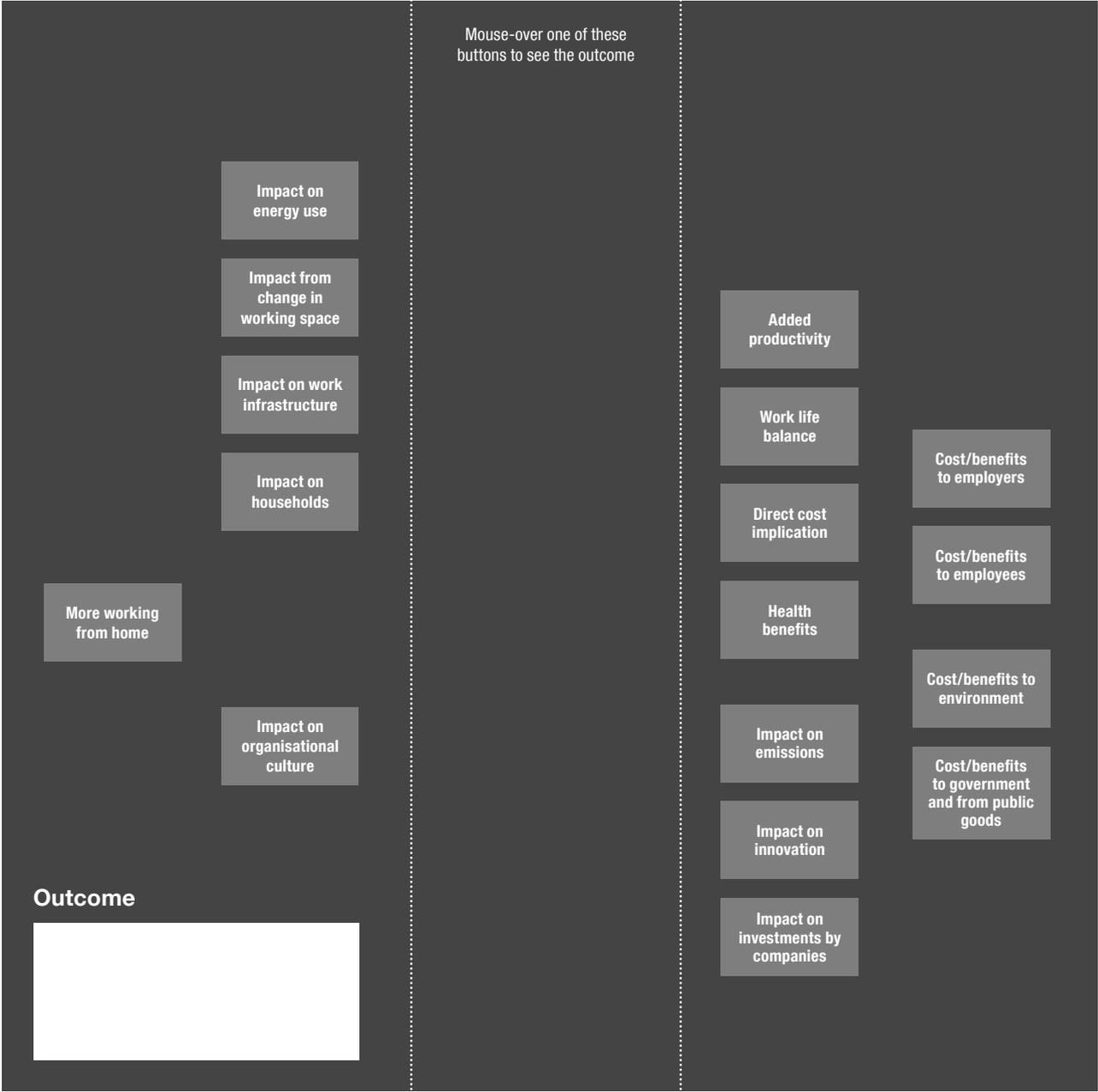
<sup>2</sup> CBS, 6 April 2020

<sup>3</sup> Maximum impact calculations assume that organisations will spread out working from home over the week, so that they can achieve maximum cost benefit by reducing office space and other running costs. In reality, the cost benefit will likely be lower.

# Less travel to and from work



# More working from home



### Impact on employers: direct cost benefits but weaker corporate culture

There are some direct implications of an increase in working from home. Since this is hypothetically a permanent change, we assume that companies would like to equally distribute the days on which employees work from home, thereby reducing the need for office space and related costs like electricity, heating and catering.

#### Direct cost savings

Taking all these direct benefits into account, we arrived at a net benefit assessment, i.e. a cost saving for companies to the tune of € 1,681.4 million per year. To put this in perspective, this saving is equal to approximately 15 percent of the amount spent on office spaces in the Netherlands per year. For this calculation, we only take into account impacts that we consider material. For instance a decrease in internet usage or coffee usage at the office is considered immaterial cost-wise.

#### Impact of less proximity to colleagues

However, the direct cost impact is only one part of the cost-benefit assessment. There are many other implications for employers

that are less quantifiable. These are mostly related to corporate culture. A decrease in proximity to colleagues, even by one day a week, could weaken corporate culture. This may result in less effective collaboration and a subsequent decrease in innovation. It could also lead to a weaker brand name, which could decrease customer loyalty. These effects have implications for company profitability in the longer run.

#### Impact on absenteeism and turnover

The impact of an increase in working from home on employee absenteeism, for reasons of health or personal circumstances, is not clear. While a weaker organisational culture would make for employees that are less connected to the company and therefore more prone to leave, flexibility in working from home is shown to decrease employee turnover. A positive impact of an increase in working from home would be a decrease in absenteeism among employees, as people that have more flexibility in working from home are less likely to call in sick.

#### Impact on productivity

Lastly, the overall impact on productivity is ambiguous. While less intense collaboration

could decrease productivity, some research suggests that people think that they are more productive when working from home. The end result therefore might be two-fold: there could be an increase in productivity for individual work and a decrease in productivity in work that requires close collaboration.



**Impact on employees: benefits from less travel time, but higher electricity bills**

**Impact on costs is varied**

Employees would save considerably by not travelling to work, but other cost implications on employees are more varied. Direct costs such as increases in gas and electricity usage are not fully offset by savings in childcare costs - assuming some employees keep their children at home while working remotely. The widespread broadband connectivity in the Netherlands – present in 98 percent of households according to Eurostat – makes any cost considerations from increases in internet usage immaterial. Overall, we estimate that the net benefit to workers would be approximately € 1,120.2 million per year. This is nearly half of total childcare costs incurred per year in the Netherlands.

**Impact on health and mental well-being**

Another major impact area for employees is their health. We deem the health impact of working from home to be positive; this is in line with research that suggests a decrease of 0.5 percent in sickness rate when working from home. Another consideration is

improved mental wellbeing from being closer to one’s children as a consequence of using less childcare services. There is not enough consensus in research on the impact of an increase in working from home on stress levels and burnout probability, but is widely considered to be positive. Furthermore, less travelling to work equals less travel related accidents and less traffic-induced stress. According to our estimates, the cost of travel accidents could go down by € 594.0 million per year if people worked from home one additional day.

**Impact on hours spent on work**

Less travelling to work also means more time available to spend on other activities. For our analysis we assume that the decrease in travel time will be spent on extra working hours, as opposed to on activities such as childcare or housework. That is an indirect benefit to employers, who would continue to pay their employees the same but would get more working hours out of their employees. To the extent that this is not the case, i.e. that the extra time saved from travelling would be spent on childcare, housework, or leisure, we would expect that the employees would accrue the benefit instead of the employers.

	Calculation	Cost/ Benefit in millions
Car work-home	Less km in millions: 3,648 Price per km: 0.32	€ 1,167.3
Public transport work-home	Less km in millions: 474 Price per km: 0.13	€ 61.6
Less traveltime	Number of minutes saved: 34 Costs per minute: 0.45	€ 0.4
Child care	Total size in million euros: 2,300	€ 230.0
Gas	m3 increase in millions: 277 m3 price: 0.77	€ 213.6
Electricity	kWh increase in millions: 564 Kwh price: 0.2225	€ 125.5
<b>Total</b>		<b>€ 1,120.2</b>



### Impact on the environment: benefits from less travelling

#### Impact of less travel

The most impactful change for the environment is clearly lower emissions from travel. With a twenty percent increase in working from home for fifty percent of the workforce, many cars would stay off the roads for an additional day of the week. This directly translates to a reduction of 434.1 million kgs in CO<sub>2</sub> emissions.

#### Impact of using less energy

But that is not all. The reduction in use of office space and lower heating requirements

would also contribute to net benefits. We calculate the impact of a decrease in heating to be in the vicinity of 171.9 million kgs of CO<sub>2</sub> emissions saved per year. There is a corresponding negative impact though – as employees would start using more heating in their homes, which is less efficient than office heating systems. Yet, this effect is not large enough to offset the other positive impacts.

The total impact on CO<sub>2</sub> emissions is 605.5 million kgs per year, which is equal to a reduction of 2 percent of total emissions from road transport in the Netherlands.

	Calculation	Increase / Decrease in CO <sub>2</sub> emissions in million kg
Gas in office	m3 reduction: 95,500,000 CO <sub>2</sub> kg per m3: 1.8	171.9
Car work-home	Total CO <sub>2</sub> by cars (work-home related): 4,341,063	434.1
Public transport work-home	Total CO <sub>2</sub> by train (work-home related): 289	0.029
Gas at home	Total CO <sub>2</sub> by gas in homes: 21,962	0.499
<b>Total</b>		<b>605.5</b>

### Impact on public goods: benefits from less travelling

#### Impact on health

Some of the immediate benefits of working from home have implications for various public goods. The prime example of that is the environmental impact, which improves the health of the population. While this has been quantified in the previous section, there are other public goods that are impacted and analysed in this section.

#### Impact on investments in infrastructure and travel accidents

Less travel to work leads to less congestion in public transport, which means better

access for the people who still have to travel to work or elsewhere, and also lower cost of operations for the government. Less travel also means less investment needed in maintaining public road infrastructure. We estimate the total net savings in investment in road and public transport infrastructure to be €124.3 million per year. Furthermore, net savings from a decrease in travel accidents and traffic jams amount to € 733.8 million. Next to that there are environmental costs related to travelling to work. These are air pollution, noise disturbance, health damage, and damage to buildings. These sum up to € 244.6 million.

	Calculation	Cost/ Benefit in millions
Travel accidents	Cost per km: 0.16 Total # km: 36,479,520,000	€ 594.0
Traffic jams	Cost per km: 0.04 Total # km: 36,479,520,000	€ 139.8
Environmental costs	Cost per km: 0.07 Total # km: 36,479,520,000	€ 244.6
Investment in road infrastructure	Investment in roads in million: 1,048	€ 104.8
Investment in public transport	Investment public in million: 195	€ 19.5
<b>Total</b>		<b>€ 1,102.7</b>



### **Distribution effects**

The impact of working from home is not equally distributed among different types of employees and employers. We discuss these distributional effects below.

We consider the net cost savings, work-life balance, and health benefits associated with less travelling and less illness to accrue to those employees that are actually able to work from home one more day a week. Data from CBS shows that these are mostly government administrators, ICT managers, policy advisers, higher education managers and professors, and business and administrative services managers. This would increase the divergence between this group of professionals and the labour intensive face-to-face workers, who are in general also less well paid. The quality of life would therefore increase for those that are already better off.

### **Everybody benefits from a better environment**

In terms of benefits to the environment – such as reduced pollution and noise reduction – and benefits to public goods – such as less traffic and more spaces in public transport-, we expect all members of society to benefit equally.

### **Bigger companies that offer flexible work are probably best-off**

In analysing the distribution effects for companies, it is anticipated that the effect will depend on the industry – the possibility to work from home differs per industry - and on the size of the company – the bigger companies are better at facilitating telework than smaller ones. We do not believe that there is a universally correct answer to the impact of an increase in working from home for companies. Despite any negative impacts on company culture, surveys show that workers would consider switching jobs in exchange for flexibility and would even be willing to accept a salary decrease for the possibility of working from home. This could mean that industries with more flexible working options and/or bigger companies would be better positioned to attract the workforce of the future. The analysis leads us to believe that the sweet spot might be to provide freedom to workers to work from home when they see fit, subject to there being at least some part of the week where face-to-face collaboration would take place.

## Appendix

	Calculation	Monetised impact in terms of cost / benefit (in millions)	CO <sub>2</sub> emissions increase/ decrease (in million kgs)	Non-monetised impact
<b>Impact on employers</b>				
office space	m <sup>2</sup> reduction: 8,700,000 m <sup>2</sup> price: 125	€ 1,087.5		
gas	m <sup>3</sup> reduction: 95,500,000 m <sup>3</sup> price: 0.77	€ 73.5		
electricity	kWh reduction: 1,560,000,000 kWh price: 0.2225	€ 173.6		
catering	Total size in millions: 3,468	€ 346.8		
Internet				There will be less use of the internet at the office, but this will not lead to lower costs
Customer loyalty				Research shows that more working from home leads to a weaker organisational culture. A weaker organisational culture erodes brand strength and therefore leads to less recognition by customers and less customer loyalty.
Productivity				A weaker organisational culture poses problems to efficient collaboration, which means that workers get less done and are therefore less productive. It is however important to note that increases in working from home are also shown to sometimes have a positive effect on employee productivity, making the net result of working from home unclear.
Employee turnover				A weaker organisational culture leads to employees feeling less connected to the company and their colleagues, and consequently to higher turnover rates. It is however important to note that flexibility in working from home is associated with a lower employee turnover rate. Therefore, the net result of an increase in working from home on employee turnover is not clear.
Profitability				A weaker organisational culture poses problems to efficient collaboration. When combined with other effects such as the erosion of brand strength and less customer loyalty, the end result is lower profitability.
<b>Total</b>		<b>€ 1,881.4</b>		

Impact on employees		
Car work-home	Less km in millions: 3,648 Price per km: 0.32	€ 1,167.3
Public transport work-home	Less km in millions: 474 Price per km: 0.13	€ 61.6
Less traveltime	Number of minutes saved: 34 Costs per minute:	€ 0.4
Child care	Total size: 2,300,000,000	€ 230.0
gas	m <sup>3</sup> increase in millions: 277 m <sup>3</sup> price: 0.77	€ 213.6
electricity	kWh increase in millions: 564 Kwh price: 0.2225	€ 125.5
Internet		
		We assume that internet costs will not be higher, given that in the Netherlands 98% of households have a fixed broadband connection at home.
Conferencing tools		We expect the use of conferencing tools to be higher, but find no evidence that this would lead to higher costs.
Less illness, incl. stress and burnout		Research shows that employees that work more from home call in sick less frequently. Long-term effects on stress levels and burnout are however not yet clear.
<b>Total</b>		<b>€ 1,120.2</b>
Impact on the environment		
Gas in office	m <sup>3</sup> reduction: 95,500,000 CO <sub>2</sub> kg per m <sup>3</sup> : 1.8	171.9
Car work-home	Total CO <sub>2</sub> by cars: 4,341,063	434.1
Public transport work-home	Total CO <sub>2</sub> by train: 289	0.028
Gas at home	Total CO <sub>2</sub> in home: 21,962	0.499
<b>Total</b>		<b>605.5</b>
Impact on public goods		
Travel accidents	Cost per km: 0.16 Total # km: 36,479,520	€ 594.0
Traffic jams	Cost per km: 0.04 Total # km: 36,479,520	€ 139.9
Environmental costs	Cost per km: 0.07 Total # km: 36,479,520	€ 244.6
Investment roads	Investment roads: 1,048	€ 104.6
Investment public transport	Investment public: 195	€ 19.5
<b>Total</b>		<b>€ 1,102.7</b>