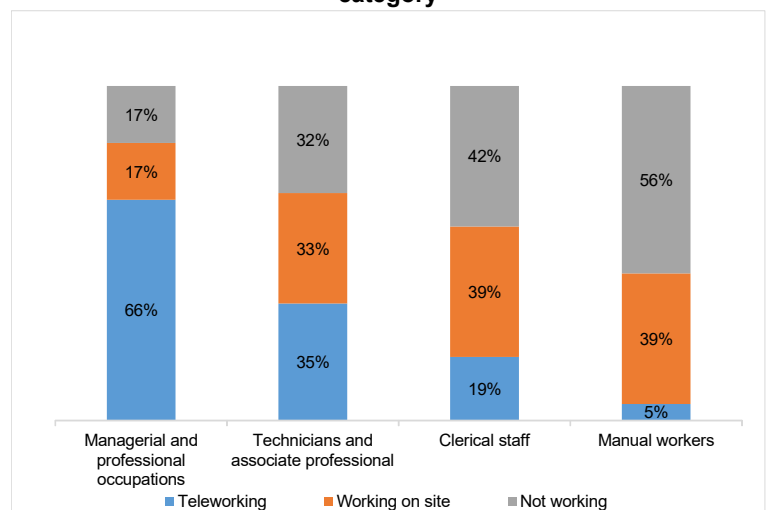


What do we know about the economic effects of remote work?

Cyprien Batut, Youri Tabet

- Remote working, also known as teleworking or telecommuting, was far from prevalent in pre-COVID France but became much more widespread during the spring 2020 lockdown, helping to keep economic activity going. Depending on the survey, some 25% to 44% of French workers reported working from home during this period. The shift to remote work occurred under unusual, pandemic-related conditions and was primarily the domain of those in managerial positions (66% of managers) and concentrated in certain occupations.
- There is, as yet, no consensus in the economic literature about the impact of remote work on productivity. There are multiple factors at play: (i) the conditions of the remote working setup (tools, training for both workers and their managers); (ii) the organisation of work and management style (employee autonomy, output- vs attendance-based expectations, management's ability to adapt); (iii) the nature of the occupation (how interdependent it is with other tasks, how much creativity is required, how independently it can be performed).
- In the longer term, post-pandemic, telework will also have impacts on labour market supply and demand, spatial distribution and the environment. Multiple and at times conflicting effects make it difficult to quantify these impacts, but they cannot be ignored. A massive shift toward telework would have significant aggregate effects on more than just how work is organised.
- Post-pandemic, the existing regulatory framework governing telework appears to be sufficiently flexible to allow the practice to become more widespread, something a growing number of both employees and employers would like to see. But social dialogue in the workplace is vital to ensuring remote work is introduced under the right conditions, tailored to the characteristics of the company.

Working situation during lockdown by socio-occupational category



Source: "Les actifs et le télétravail à l'heure du confinement", survey conducted by IFOP for the Fondation Jean-Jaurès between 21 and 23 March 2020. How to read this chart: As at 23 March 2020, 66% of people in managerial and professional occupations were working remotely.

1. Certain job categories saw a sharp increase in remote working during the pandemic

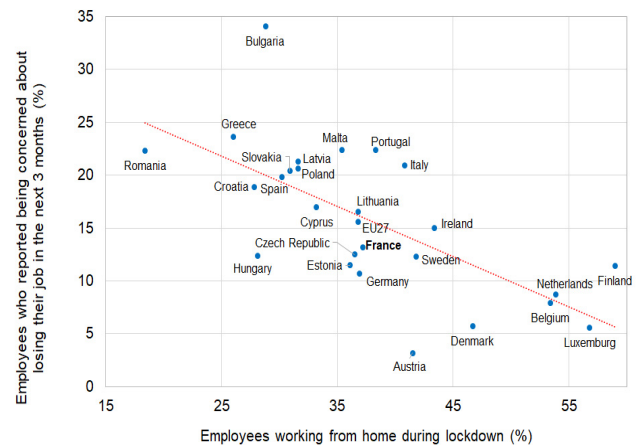
1.1 Remote work was not prevalent prior to the crisis

In 2017, only 3% of French workers telecommuted on a regular basis (at least one day a week), according to the statistics division of the Ministry of Labour (DARES). Including more occasional teleworkers in the calculation only increases the figure to 7%. According to Eurostat, France is slightly above the European average (5%), but below the Netherlands (14%) and Finland (13%).¹

There is more variation in telecommuting rates by occupation and socio-occupational category than by sector. In France, 61% of those regularly working remotely were in managerial roles. In terms of occupations, commercial managers and computer engineers topped the list, at 16% and 14% respectively.² Some occupations are not suited to telework, for instance those in farming, construction, hospitality and personal services. More broadly speaking, the economic literature suggests that only a portion of occupations are candidates for full-time telework – approximately 37% of all workers in France,³ although other occupations could lend themselves to partial telework.

The countries with the highest incidences of telecommuting during lockdown were also those where people were least concerned about losing their job due to the economic crisis (see Chart 1). It is unclear whether there is a causal relationship between job security and remote work; during the lockdown, widespread use of telecommuting also allowed employers to keep their operations up and running while preventing the spread of the virus at work and on public transit, thereby mitigating the economic cost of the lockdown. According to a study in Germany, the counties and sectors where remote work increased the most during lockdown were also those with the fewest job losses and lowest infection rates.⁴

Chart 1: Comparison by country between the proportion of remote workers during lockdown and the proportion of employees concerned about losing their job in the next three months



Source: Eurofund, *Living, working and COVID-19* (May 2020); DG Trésor calculations.

How to read this chart: Looking at Ireland, during lockdown, 15% of employees reported being worried about losing their job in the next three months, and 43.4% of employees were working from home.

1.2 Despite suboptimal pandemic teleworking conditions, some employees want to continue working remotely post-COVID

During the pandemic, there was a sharp rise in people working from home: surveys show between 25% (Acemo-Covid survey, May 2020) and 44% (EpiCOV) of employees were working from home during lockdown,⁵ with variations depending on socio-occupational category (see chart on first page) and sector (see Box 1).

The emergency shift to remote work during lockdown occurred under unusual conditions (full-time, no childcare solutions, no preparation, etc.). More critically, for many it was not by choice, and having to share their workspace with other household members (spouse, children) no doubt contributed to blurring the lines between personal and work life. The situation affected women in particular, who were less likely than men to

(1) Hallépée S. and A. Mauroux (2019), "Quels sont les salariés concernés par le télétravail?", *DARES analyses*, No. 051, November 2019; and Eurostat, "How usual is it to work from home?", February 2020.

(2) DARES, aforementioned study.

(3) Dingel J. and B. Neiman (2020), "How Many Jobs Can be Done at Home?", Becker Friedman Institute white paper, March.

(4) Alipour J.-V., Harald Fadinger H. and J. Schymik (2020), "My Home Is my Castle – The Benefits of Working from Home During a Pandemic Crisis: Evidence from Germany," CRC TR 224 *Discussion Paper Series*, University of Bonn and University of Mannheim, Germany.

(5) DARES (2020), Acemo-Covid survey, May 2020; and INSEE, "Confinement : des conséquences économiques inégales selon les ménages", *Insee Première*, No. 1822, October.

have a dedicated room to work in during lockdown (25% vs 41%).⁶

While the data are not comprehensive, certain surveys suggest that some employees (roughly three-quarters) would like to continue working remotely post-pandemic.⁷ These figures should be taken with a grain of salt, however, as they could also reflect concerns about returning to the office for health reasons. As of July and August, French surveys estimated that only

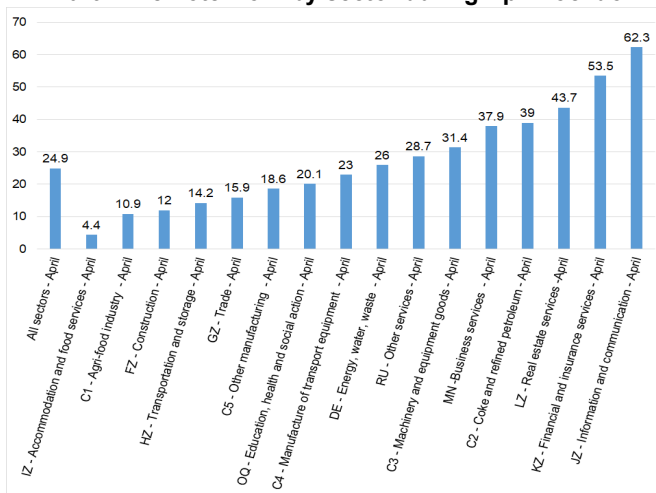
10% of French employees were still teleworking.⁸ However, there appear to be country-by-country differences in the continuation of remote work post-lockdown. A survey conducted in August suggests teleworking rates were higher in continental Europe than in the UK.⁹ This difference could be explained by the longer period of lockdown or the different nature of occupations.¹⁰

Box 1: Sector-by-sector analysis of remote work in lockdown

The obligatory nature of telework during lockdown makes for almost natural experiment conditions (even if not representative of non-pandemic telework) to evaluate which sectors are best able to quickly pivot to remote work. According to the Acemo-Covid survey conducted by DARES in May 2020, the top three sectors for remote working were information and communication (62% of workers), financial and insurance services (53%) and real estate services (43%), in contrast to accommodation and food services (4%), the agri-food industry (11%) and construction (12%) on the other end of the spectrum.

Many companies seem to think that this degree of telework is unsustainable. In April 2020, nearly 37% reported they would not be able to continue operating as usual for longer than one month due to the high proportion of employees working remotely.

Chart 2: Remote work by sector during April lockdown



Source: DARES (2020), Acemo-Covid survey, May.
Scope: Private-sector employees excluding agriculture, individuals employing domestic help and offshore operations; France (excluding Mayotte).

(6) INED (2020), "Le travail et ses aménagements : ce que la pandémie de covid-19 a changé pour les Français"; and M-A Barbara (2020), "Unequal living conditions under lockdown", *Trésor-Economics* No. 264.

(7) According to an OpinionWay/Square Management survey conducted on 13 and 14 May 2020 with 1,015 respondents (quota sampling) for *Les Échos and Radio Classique*, 80% of workers who had experience working remotely would like to continue to do so post-lockdown, at least part-time.

(8) DARES (2020), Acemo-Covid survey, August and September.

(9) Morgan Stanley survey, 4 August 2020, conducted on the basis of 12,500 online interviews.

(10) According to Dingel and Neiman (2020), the proportion of jobs compatible with remote work is five points higher in the UK (42%) than in France (37%).

2. In the short term, the economic effects of remote work will largely depend on the conditions under which it is practised

2.1 Remote work is likely to change working conditions and quality of life in the workplace

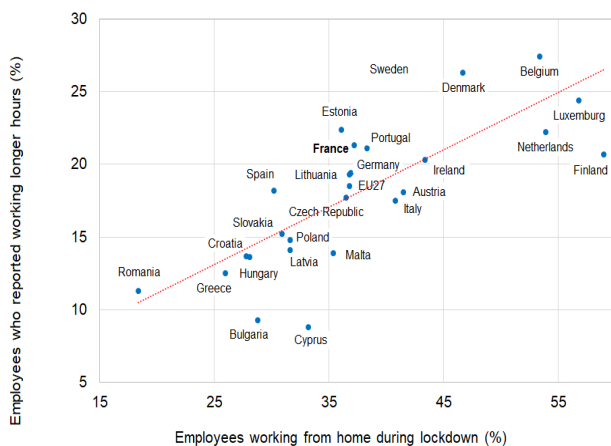
The impact of remote work on quality of life in the workplace is unclear.¹¹ While telework offers more autonomy (employees are better able to organise their work as they like), there is increased risk of isolation due to fewer social interactions.

And while the flexibility of working remotely may allow for better work/life balance, it can also blur the lines between the two. For employees working from home, family time can easily encroach on work time, but more intense and irregular work hours can also affect their personal life. That said, overall, countries with higher

rates of remote working during lockdown were also those where employees reported having the least difficulty balancing work and home life (see charts 2 and 3). A possible explanation for this is that they spend less time commuting,¹² time which they can reinvest in both work and home life.

A decisive factor is whether senior management prioritises the work/life balance of its teleworkers. Working remotely from a coworking space could also help mitigate these risks (see below). To avoid compromising hourly productivity or widening the gender inequality gap, any widespread adoption of remote work should be accompanied by a continued expansion of childcare options.

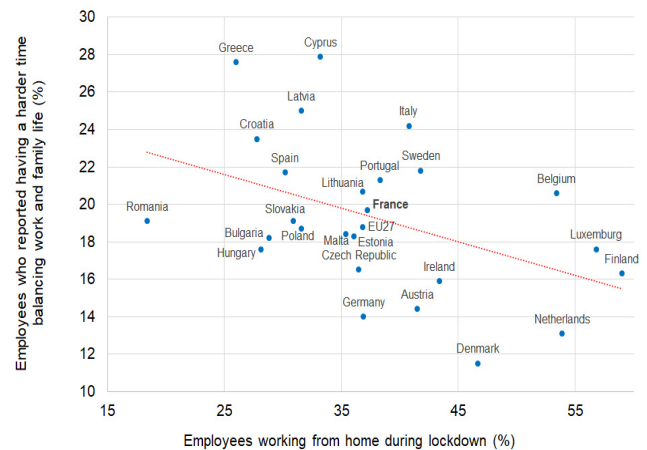
Chart 3: Comparison by country between the proportion of remote workers during lockdown and the proportion of employees who reported working longer hours during lockdown



Sources: Eurofund, *Living, Working and COVID-19 (May 2020)*; DG Trésor calculations.

How to read this chart: Looking at Romania, during lockdown, 11.3% of employees reported working longer hours than before, and 18.4% of employees were working from home.

Chart 4: Comparison by country between the proportion of remote workers during lockdown and the proportion of employees who reported having a harder time balancing work and family life



Sources: Eurofund, *Living, Working and COVID-19 (May 2020)*; DG Trésor calculations.

How to read this chart: Looking at Austria, during lockdown, 14.4% of employees reported spending less time with their family than before, and 41.5% of employees were working from home.

(11) To review the literature on the pros and cons of telework for quality of life, see for example: Vayre E., "Les incidences du télétravail sur le travailleur dans les domaines professionnel, familial et social", in *Le travail humain* (PUF), 2019/1 Vol. 82, pp 1-39.

(12) According to a 2020 France-wide personal transportation survey (*Enquête nationale mobilité et modes de vie 2020*), French workers spend more than 12 hours a week travelling, nearly half of which is time spent commuting.

2.2 Under the right conditions, remote work could be a boon to productivity and company performance

Several empirical studies demonstrate that telework has a positive impact on productivity, but this impact varies widely (between 5 and 30%).¹³ Other studies suggest that when selection bias is controlled for, there is no impact on productivity.¹⁴ There is also no consensus in the economic literature as to the types of work that see the most productivity gains from remote work. Furthermore, remote working is often inconsistently defined, or studies will only give results for minor sub-populations, sometimes selected on a volunteer basis,¹⁵ which can introduce selection bias and make it difficult to extrapolate results.

In any event, when telecommuting is introduced full-time without warning or preparation, for jobs that do not necessarily lend themselves to it, and without childcare options, it can lead to a drop in productivity. A study of workers in a Japanese research centre conducted during lockdown estimated a 63% drop in productivity.¹⁶

In theory, there are multiple opportunities for productivity gains (by hour or by worker). Firstly, remote working can lead to higher quantities of actual work, thanks to time saved commuting, for example. Those who worked from home during lockdown were more likely to report that their time spent working had

increased.¹⁷ Secondly, remote working can increase hourly work productivity, either via improved working conditions, allowing the worker to be more focused and take more initiative in their work,¹⁸ or via more investment from the worker,¹⁹ who is seeking to "compensate" for their physical absence. It could also push companies to make the transition from an attendance-based culture, which the literature suggests is still prevalent in France, to one based on output.

Remote working can be a source of cost savings for companies (real estate, energy, salaries). In the aforementioned experimental study on Chinese companies, two-thirds of savings were realised on real estate and energy costs related to downsizing workspaces. Furthermore, remote work could cause salary costs to go down if there is less disutility in the eyes of workers (see Box 2). It could also help reduce recruitment costs, with lower turnover observed in companies that have introduced telecommuting options.²⁰

Remote working could also speed up the arrival of the digital economy, which could spur productivity gains. Reduced expenditure on costs such as real estate could be reallocated to productive capital investments (equipment and training, for example, are better investments for labour) and contribute to an increase in labour productivity.²¹

(13) These gains are estimated to be 22% by a study conducted in call centres in China (see Bloom N., Liang J., Roberts J., Ying Z., "Does working from home work? Evidence from a Chinese experiment", *The Quarterly Journal of Economics*, 2015). They are estimated to be 5% to 30% in large French companies according to a study conducted for the Directorate General for Enterprise; however, the methodology is not available (see Greenworking, "Le télétravail dans les grandes entreprises françaises", May 2012).

(14) Brueggen A., Feichter C. & K. Haesebrouck (2019), "The Effect of Telecommuting on Productive Effort and Reporting Behavior".

(15) P. Pora (2020), "Comment le télétravail affecte-t-il la productivité des entreprises ? Les enseignements très partiels de la littérature", *Le Blog de l'INSEE*, 23 October, <https://blog.insee.fr/comment-le-teletravail-affecte-t-il-la-productivite-des-entreprises-les-enseignements-tres-partiels-de-la-litterature/>. Note that in France, telework is supposed to be voluntary.

(16) Masayuki Morikawa (2020), "COVID-19, teleworking, and productivity". Study conducted on the basis of a self-reporting survey and a subjective measure of productivity ("Suppose your productivity in the office to be 100, how do you evaluate your working productivity at home?"). This survey looks at the particular context of an abrupt shift to remote work without preparation. It can be inferred, for example, that respondents' productivity could have been hampered by not having access to certain services from their homes.

(17) INSEE (2020), "Confinement : des conséquences économiques inégales selon les ménages", *Insee Première*, No. 1822, October 2020.

(18) Angelici M. and P. Profeta (2020), "Smart-working: Work flexibility without constraints", Dondena working paper, No. 137. In this study, telecommuting is associated with greater flexibility in terms of work organisation, which partly explains productivity gains.

(19) Tissandier P. and S. Mariani-Rousset (2019), "Les bénéfices du télétravail : Mobilité modérée : réduction du stress et des émissions de gaz à effets de serre", *Revue francophone sur la santé et les territoires*.

(20) Bloom *et al.* (2015), aforementioned article.

(21) Bergeaud A., Cetté G. and R. Lecat (2020), "Current and past recessions: a long-term perspective", Banque de France, Post No. 159, 27/04/2020; and Bergeaud A. and S. Ray (2020), "The macroeconomics of teleworking", *Banque de France Bulletin*, No. 231/2, https://publications.banque-france.fr/sites/default/files/medias/documents/820258_bdf231-2_teletravail_vfinale.pdf.

Box 2: Impact of remote work on salary costs: Rosen's model

Rosen's model (1974), which was inspired by hedonic wage theory, accounts for the heterogeneity of wages between individuals as a means of compensating for the differences in appeal between different types of work. In this context, remote work can be seen as a factor that makes work more attractive. Workers would therefore be willing to sacrifice a portion of their salary for more flexibility in their work.

In "Valuing Alternative Work Arrangements" (2017), Amanda Pallais and Alexandre Mas attempted to estimate this effect by conducting an experiment as part of a US call centre recruitment process. They concluded that the average candidate would be willing to accept a 10% pay cut for the ability to work from home. It is a relatively significant effect, primarily concentrated among women, particularly those with children, who more strongly value the flexibility afforded by remote work. By way of comparison, according to the authors, the average candidate would be willing to accept as much as a 30% pay cut for full control over their own schedule. Conversely, employees working from home may ask to be compensated for the expense of setting up a home office. It should be noted, however, that the study was conducted with a specific type of job that can more easily be done remotely, and the results cannot necessarily be extrapolated across all types of work.

Lastly, the practice of telecommuting from a coworking space could help to improve worker productivity compared to working from home, by guaranteeing appropriate material working conditions and allowing for workplace interactions outside of the company. Third place²² environments could also be used by remote workers. Third places promote economic and social development for the local community and have been attracting increasing attention from local governments.

However, not all aspects of remote work contribute to increased productivity. Face-to-face communication is better for team productivity compared to electronic communication, particularly for complex or urgent tasks.²³ Remote work leads to less social interaction in the workplace, which curtails knowledge sharing (both formal and informal). At the individual level, the relationship between productivity gains and time spent working remotely may therefore follow a bell-shaped curve.²⁴ The optimum balance may be somewhere around two or three days of teleworking a week, giving the worker the ability to organise their work to maximize the benefits of each mode of working (remote and on-

site).²⁵ Remote work may also result in negative externalities for non-teleworkers: a high proportion of employees working remotely could disrupt their work and impact their productivity. It could also affect the motivation of non-teleworkers, resulting in higher rates of sick leave or absenteeism.²⁶ It would therefore be in the best interests of any company looking to adopt remote working to do so as part of a company-wide strategy that takes ineligible employees into account.

2.3 Workplace social dialogue could help advance remote working under the right conditions

The positive impacts of remote work appear to be more appreciable in companies where it has been introduced in a formalised manner. Recent legislative changes have made it easier to do so (see Box 3). Apart from ensuring that remote work remains a choice for employees, a formalised policy is a way to limit irregular hours: with a collective or individual agreement governing remote working, there would be less of a tendency to work more than 50 hours a week or after 8pm.²⁷ The "right to disconnect", which is not always upheld in practice, is an especially salient issue for

(22) "Third places" are shared spaces. Depending on the needs of the community, they usually include workspaces and spaces for social or cultural activities. They also serve to spark encounters between local stakeholders to create economic and social value.

(23) Battistoni D., Blanes J., Vidal I. and T. Kirchmaier (2017), "Is Distance Dead? Face-to-Face Communication and Productivity in Teams." *CEPR Discussion Paper*, No. 1192.

(24) Effets positifs potentiels du télétravail sur la productivité à l'ère post-COVID-19" (OECD, 2020). Multiple effects appear to suggest this relationship: (i) job satisfaction increases, then begins to decrease at a certain level of telework due to the risk of isolation; (ii) the loss of productivity related to fewer interactions is low to non-existent, then begins to grow at a certain level of telework.

(25) Aforementioned study, Greenworking, "Le télétravail dans les grandes entreprises françaises".

(26) E. Linos (2019), "When working from home changes work at the office: Measuring the impact of teleworking on organizations", *working paper*.

(27) *INSEE Références* (2019), "Le télétravail permet-il d'améliorer les conditions de travail des cadres ?".

teleworkers (see Box 3). Lastly, social dialogue may yield solutions to the risk of exacerbating disparities between occupations, for example by companies

introducing measures to improve the quality of life in the workplace for those whose jobs are incompatible with remote work.

Box 3: The regulatory framework for remote working and the right to disconnect

The Ordinance of 22 September 2017 both secured and relaxed the regulatory framework for remote working, which can now be put in place by a collective bargaining agreement, an employer charter or even just an email. Before, telework would need to be written into the employment contract or included in an addendum in order to be formalised. There has been uptake on the matter in collective bargaining, with 1,613 company-level agreements recorded in January 2020. In addition to these agreements, negotiations began on 3 November 2020 between trade unions and employers' organisations, with the possibility of a new national multi-sector agreement (ANI) on telework being reached.

The Act of 8 August 2016 introduced the "right to disconnect" for all employees, with varying degrees of success in actual practice. Companies must implement mechanisms for regulating the use of digital tools to ensure there is no encroachment on rest periods or time off and to ensure work/life balance. However, there is no legal penalty for not having an agreement or charter in place. In 2019, 1,140 company-level agreements on the right to disconnect were recorded.^a

- a. Companies that have a union representative (mandatory for those with more than 50 employees) are required to address these issues as part of the mandatory annual negotiations on quality of life at work; if no agreement is reached (and for other companies), the company must draw up a charter which provides for the implementation of training and awareness programs on the reasonable use of digital tools.

3. The longer-term effects of remote work

3.1 The effect of more widespread telework on spatial inequality and the labour market

Remote work has the potential to create a better balance between supply and demand on the labour market and could also lead to major shifts in spatial distribution. Since telecommuting opens up more possibilities for workers in terms of location, it could end up making big cities less attractive and cool down the real estate market in these areas (lower demand for both office and residential spaces). It could also increase the appeal of non-urban living, ushering in an influx of new rural telecommuters, which could lead to the development of coworking spaces or improvements to telecommunications infrastructure. However, the fact that work isn't the only factor at play in deciding where to live (proximity to services, culture, etc.) would tend to mitigate this effect.²⁸

Looking beyond French borders, full-time telework

raises the possibility of qualified workers competing for jobs on the global stage, and the emergence of "telemigrants".²⁹ However, since there is a cost to the employer associated with remote workers in terms of administration, recruitment (difficulty of organising in-person interviews) and coordination (different time zones, language and cultural differences), there is more likely to be a rise in subcontracting for certain specific tasks, serving as a springboard for self-employed workers of different nationalities.

3.2 The effect of more widespread telework on greenhouse gas emissions

More widespread telework could also help reduce greenhouse gas (GHG) emissions, but there is no consensus on this theory. Andrew Hook *et al.*³⁰ analysed 39 studies on the subject and considered only 14 to use a robust methodology. While seven of these

(28) INSEE *Première* (2016), "L'accès aux services, une question de densité des territoires", No. 1579. In mainland France, one in two inhabitants can access the main everyday services by road in less than four minutes. That said, depending on the municipality, it can be as high as three times that number, and even higher if seeking higher quality services or a wider variety.

(29) Term coined by Richard Baldwin in his 2019 book *The Globotics Upheaval: Globalisation, Robotics and the Future of Work*.

(30) Hook A. *et al.* (2020), "A systematic review of the energy and climate impacts of teleworking", *Environmental Research Letters*.

studies concluded that telework would lead to a reduction in GHG emissions, five of them found the opposite.

In France, a study conducted on behalf of France's energy transition agency (ADEME)³¹ found that an average of 2.9 days of remote work per week would lead to a roughly 30% reduction in the environmental impacts of commuting, which is responsible for 3.7% of GHG emissions. That would mean a 0.5% reduction in GHG emissions, or the equivalent of the annual emissions of 366,000 French citizens. The study uses a particularly ambitious scenario in terms of remote working rates, however, and should be read with this in

mind.³²

Remote work could also have a rebound effect³³ and result in teleworkers travelling more for other purposes (personal trips or commuting to coworking spaces) or other household members travelling more, using the teleworker's now-available vehicle. It could also lead to an increase in GHG emissions due to household energy use. Lastly, remote working would mean more use of digital technologies and an increase in related emissions; currently, 2% of global GHG emissions are related to the use of data centres and network infrastructure.³⁴

(31) "Impact du télétravail, des tiers lieux et du coworking sur la réduction des consommations d'énergie et émissions de gaz à effet de serre, et sur l'organisation des entreprises", BIO by Deloitte, Greenworking, BVA, for ADEME, 2015.

(32) The assumptions used (50% of remote workers telecommuting an average of 2.9 days, or 58% of their time) yield a result of 29% of hours worked remotely. This seems overly ambitious considering that (i) the objective in France's national low-carbon strategy is 10%, (ii) the proportion of jobs that can be done remotely under appropriate conditions in France is estimated to be 30%.

(33) For a review of the literature in French, see Gossart C. and F. Flipo (2009), "Infrastructure numérique et environnement : l'impossible domestication de l'effet rebond", *Terminal*, No. 103-104, p. 163-177.

(34) ADEME (2019), "La face cachée du numérique".

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