



D1.3 RESEARCH PROTOCOLS

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List of abbreviations

Aldgate	ALDGATE STRATEGY GROUP SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA
SkiLMeeT	Skills for Labour Markets in the Green and Digital Transition
CEDEFOP	European Centre for the Development of Vocational Training
DMP	Data Management Plan
EC	European Commission
EU	European Union
FEEM	FONDAZIONE ENI ENRICO MATTEI
GA	General Assembly
GDPR	The EU General Data Protection Regulation
HE	Horizon Europe
IBS	FUNDACJA NAUKOWA INSTYTUT BADAN STRUKTURALNYCH
IPS	INSTITUTE OF PHILOSOPHY AND SOCIOLOGY
QAP	Quality Assurance Plan
LISER	LUXEMBOURG INSTITUTE OF SOCIO- ECONOMIC RESEARCH
MB	Management Board
NDA	Non-disclosure agreement
OJV	On-line Job Vacancy
REA	Research Executive Agency
RWI	RWI - LEIBNIZ-INSTITUT FUR WIRTSCHAFTSFORSCHUNG
EAB	External Advisory Board
TNO	THE NETHERLANDS ORGANISATION FOR APPLIED SCIENTIFIC RESEARCH
UU	UNIVERSITY OF UTRECHT
WP(s)	Work Package(s)

1 Introduction

Substantiation of the aim of the study based on literature. Describe what has already been done, what the current addition is and why it is interesting.

Objectives of proposed work

Rapid changes in European labour markets induce shifts in skills demand and supply. The demand side changes as firms have to restructure in light of changing customer demands, production technologies and costs, and regulatory environment, particularly with respect to the green transition. The supply side changes because of demographic trends (aging), educational expansion, or updated training curricula. This may lead to a situation where some skills are undersupplied (skills shortages) and available skills are not perfectly in line with current and future skill demands (skills mismatch).

Employers, workers and policy makers are therefore challenged to continuously be aware of and respond to these changing skills requirements, shortages and mismatches. A good understanding of the drivers (high impact variables) and solutions to these challenges is essential.

The SkiLMeeT project therefore pursues the following three main goals:

1. Produce sound indicators that help to better understand the extent of skills mismatches and shortages, and identify which countries, regions, occupations, industries, and individuals are most affected;
2. Provide novel insights on the effects of specific drivers that lead to altered skills requirements and therefore skills mismatches and shortages, with a particular focus on the green and digital transitions;
3. Present viable pathways for reducing skills shortages and mismatches, e.g., beneficial worker transitions, and education and training.

Within SkiLMeeT, WP2 focuses on studying skills shortages and mismatches, as well as their drivers on the supply side of the labour market: **the workers**. In addition, all partners are involved in interviewing representatives of the three main stakeholders: employees, employers and policy makers. WP5 explores how transitions contribute to a better skills match, and what determines successful transitions, including through upskilling and reskilling of workers, and country-specific factors in 6 partner countries. It collects qualitative information by carrying out occupational case studies in each country. Based on the results from the quantitative analyses, the occupations will be decided.

Project concept and advances beyond the state of the art

An important source for gaining insight into the supply side of the labour market is profile data from online platforms like LinkedIn, Google and Meta. Online platform data are not yet widely used in scientific research into the labour market

The new data generated by collecting resumes in WP2 and conducting interviews during the case studies in WP5.

Which ethics activities have already been done?

- ✓ DPIA: We conducted a Quick Scan DPIA and found that the performance of a full DPIA is not required. The project does not collect sensitive person-related information, nor does it have plans to analyse data at the individual level. The project collects CVs and uses interviews data to produce new data. During the research, the persons are well informed and are requested to give their consent.
- ✓ Opinion DPO: We discussed with the DPO of TNO our situation. The DPO agreed with us that the project is not focused on collecting or analyzing personal data.
- ✓ Data Management Plan: We already prepared first version of the D7.1 DMP which is a requirement from EC.

We will provide the information about two main activities that may have an impact on persons:

- Collection of resumes
- Case studies; qualitative interviews

2 Collection of resumes

- Responsible Task-leader: TNO

- Goal:

Preparing big data to analyze the supply of skills across European countries.

The supply will be derived from two data sources:

- Individual data: Resume data from individuals, which we collect in a data donation campaign. Participants donate the resume data they are willing to share with us and they explicitly sign a consent form that specifies how we will anonymize, store and use their resume data.
- Aggregated data: job market supply data aggregated and shared by LinkedIn. LinkedIn aggregates the data based on their user profile data and shares only the aggregated data, not the data of individuals

- Study design:

We will initiate multiple campaigns to collect resumes through both LinkedIn, Google and Meta platforms. Both platforms offer various targeting options, including geographic location, which aligns with our study's focus. LinkedIn additionally allows us to target specific job titles relevant to our research objectives. With an investment of EUR 10.000 in the campaign of the first year, we estimate to receive 8.000-20.000 resumes.

- Study population:

Individual skill supply data from the data donation campaign:

- *Inclusion criteria*
 - Countries: people who live or work in Europe.
 - Occupations:
 - People with a digital or green job (see below), as their current job or in their job history.
 - People with a job that shares a lot of skills with digital or green jobs, as their current job or in their job history, so that the amount of education they need for a digital or green job is relatively low.

A digital job is a job that requires significantly more digital skills than are required on average on the job market. Similarly, a green job is a job that requires significantly more green skills than average. We have selected lists of digital and green jobs from ESCO.

- *Exclusion Criteria*
 - No specific exclusion criteria
- *Justification of sample size (possibly power calculation)*
 - Targeted sample size: 5.000-10.000 user profiles. This is an estimation based on the available budget.
- *How to deal with dropout and replacement of participants*

We do not expect a large number of dropouts, as participants only need to share their data once. Drop-outs would only entail people that ask us to not use their data after they have shared it.

Aggregated skill supply data shared by LinkedIn:

- *Inclusion criteria*
 - Same inclusion criteria as for the individual skill supply data from the data donation campaign, based on selected countries and occupations.
- *Exclusion Criteria*
 - No specific exclusion criteria
- *Justification of sample size (possibly power calculation)*
 - We expect to receive data aggregated from all the user profile data available on LinkedIn for the countries and occupations selected in the inclusion criteria
- *How to deal with dropout and replacement of participants*
 - The aggregated data is provided by LinkedIn, not by participants. Therefore, no drop-out is expected. LinkedIn users cannot opt-out to be excluded from the aggregated LinkedIn data, and they do not need to, as no individual data is shared with us by LinkedIn.

- Description of the research:

We gather data on digital and green skill supply in the form of resumes, and refine it with multiple additional datasets. Resumes are especially well-suited because they not only provide information of how workers develop over time in experience and skills, but also provide timed data on where supply and demand met in the labour market at a given point and sector.

We gather resumes directly from the owners of the resumes over two channels. First, LinkedIn, aimed at people with academic degrees. Second, Meta and Google, where we gather data from people with and without academic degrees. In both cases, the participants are informed about the type of questions the SkilMeeT-project covers and how their data will be processed. It is required that the participants give their informed consent to upload the data. We allow for two ways to submit a resume. If the participants have an up-to-date LinkedIn profile, we explain them how to download their own LinkedIn profile (the resume) as a pdf-file and ask them to upload it into our system. This data is semi-structured and in the same format for any LinkedIn user. When uploaded, the PDF is processed by a script which extracts the most important information (occupational history, skills, experience) and removes all personal data. The resulting data is anonymous as it is reduced to non-identifiable combinations of variables. In case of occupations being rare enough that it is plausible that a person could be traced back with these data points, the entry will be deleted.

As for successful processing it is nonetheless necessary to save the pdf-file for the time the processing takes, we will ask for consent to store the PDFs for up to 12 months, before it is deleted and only the anonymized data is stored. We aim to delete all PDFs which were uploaded within 12 months.

For participants without an up-to-date LinkedIn profile, we provide a “survey” input form, where respondents are asked to provide data on (up to) their last three full-time work experiences. This includes the job title, timeframe, company size, sector, location, and important skills. We provide the same information to participants of this channel, and also ask for consent for the same rights as it might be necessary to remove certain data points.

To incentivize participation, we will offer participants the chance to enter a raffle with ten prizes valued at €1,000 each. Prizes will consist of smartphones or tablets (specific devices to be determined). Participants will be required to provide their email address for raffle entry. Email addresses will be stored securely for up to one year following the resume collection period. To verify eligibility and prevent fraudulent entries, winners will be required to submit identification and may be subject to a video call.

The form to be filled out and submitted by the participant will be created using Microsoft Forms or Survalyzer (via TNO) and the file transfer (of the LinkedIn user profile, if shared) will take place using WeTransfer. Data will be stored GDPR-compliantly within the Netherlands.

The dataset will be refined and provided weights by comparison to two further datasets: For all countries of analysis, we will receive aggregated high-level data provided by LinkedIn, describing the population of LinkedIn. Second, for the individual countries of analysis, we will

use the respective countries Labour Force Surveys (LFS) to determine the correct weights to be used for later labour supply analysis.

▪ Outcome variables:

A large dataset containing supply data of digital and green skills per occupation per country weighted based on distributions in Labour Force Surveys (LFSs).

▪ Data-analysis and statistics:

Statistical analysis such as distribution and outlier analysis, correlation analysis, t-test, regression analysis, and machine learning.

▪ Risk analyses:

In addition to LinkedIn's aggregated data, we will directly approach LinkedIn users to share their online profile with us. The resumes will be collected via LinkedIn Campaign and Meta, Google Campaign tools.

- We may not be able to recruit enough participants to reach a representative sample size. We aim to avoid this by:
 - Posting our data collection campaign in different social media channels, which are expected to reach a number of people that is at least 100 times as large as the targeted number of participants
- The sample of participants we recruit may not have a representative distribution among different jobs or other features. We aim to prevent this by regularly checking the distributions during the data collection process and adjusting our recruitment efforts (e.g. targeted groups) accordingly.

Participants may be personally identifiable, despite our efforts to prevent this, and may be contacted by third parties based on their data (e.g. for advertisement or recruitment purposes). We aim to prevent this by:

- Anonymizing the data directly before storing them
- Storing the data securely
- Deleting the individual data points after computing the aggregated statistics we aim to produce
- Publishing only the aggregated data (or anonymous non-aggregated)

Consent forms and information sheets are used (see annexes). The results are aggregated, no individual results are identifiable. Individuals can always retract their resumes shared.

3 Case studies; qualitative interviews

Responsible WP Leader: IBS

▪ Goal:

Examine how transitions contribute to a better skills match, and what determines successful transitions, including through upskilling and reskilling of workers, and country-specific factors.

- Outcome variables:

Qualitative insights into upskilling, reskilling and skills transitions across countries as well as country-specific factors.

- Data-analysis and statistics:

We conduct four occupational case studies for Bulgaria, Germany, Italy, Luxemburg, the Netherlands and Poland. For each country, we conduct at least 28 in-depth qualitative interviews (7 interviews x 4 occupations), of which 5 will be biographical interviews per occupation. If saturation is not attained, the sample size would be increased. The occupations for the analysis are selected based on our quantitative research, indicating occupations with high magnitude labour and skills shortages (such as nurses, software engineers, or welders). We don't know which occupations yet, as those will be determined by the quantitative results in earlier work packages. Two of the occupational case studies are the same across the six countries and the two others are country-specific. The case studies will consist of face-to-face and group interviews with individuals from companies. These will be carried out using a standardized interview protocol, to ensure comparability across companies and countries.

Qualitative data from face to face and group interviews will be transcribed and processed via a thematic content analysis approach (Braun and Clarke, 2006). They are interpreted and categorized using a coding tree (coding matrix). Each case will be described in a mini-case study report (2–3 pages). Cases will be compared with each other and described in a synthesis report (M33) and in a policy brief (M33) on the qualitative insights into upskilling, reskilling and skills transitions across countries.

- Disadvantages:

Case studies are time-consuming and create a large volume of data which may be difficult for the researchers to analyze and compare across countries. However, we believe this qualitative data will provide valuable knowledge and insight into how successful skills matches and job-to-job transitions on the labour market can be realized. Joint interview protocols and coding matrix should help researchers to analyze and compare findings.

- Risk analysis:

The risks of the study include the difficulty of finding relevant participants. In this task, the researchers will mobilise their networks and use social media and the support of trade unions, professional associations, etc. to recruit the required number of respondents. In order not to burden participants and to comply with ethical regulations the following measures will be taken. All interviewees will receive detailed information about the research and will be asked to sign consent forms. The content of the interviews will be processed in an anonymised and/or aggregated form in order to produce a research output: i.e. national occupational case study reports. Participants will be informed that their participation in this study is voluntary and that they may decide not to participate or change their decision and withdraw their consent at any time without giving any reason.

Annex 1. Participants Information Sheet for collecting resumes

You are invited to take part in a research project called as SkilMeeT which stands for "Skills for Labour Markets in the Green and Digital Transition". Before you decide to join, you need to understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully. Talk to others about the study if you wish.

Please ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the study about and who is organising and funding the study?

In SkilMeeT, we investigate what skills workers have and to what extent these skills are in demand in Europe. This allows us to analyze where skills shortages and skills mismatches occur in Europe and how these can be resolved (by job and career transitions, reskilling or upskilling). Special attention is paid to the digital and green transitions because significant employment growth is expected there. SkilMeeT provides insights into how we can equip workers with the skills they need now and in the future for the digital and green transition across Europe.

TNO is organizing this research by using European Union funds.

What would taking part involve?

We use your resume data to investigate what skills users of LinkedIn and Meta, Google have, what education and training you have completed, and what job and career changes you have undergone. We use this information to analyze skills shortages and mismatches in Europe and identify possible solutions (job and career transitions, reskilling or upskilling).

You can submit your resume in two ways. 1) If you have an up-to-date LinkedIn profile, you can download your own LinkedIn profile (the resume) as a pdf-file and upload it into our system. When you uploaded it, all personal data will be removed. The resulting data will be anonymous. We aim to delete your resume which were uploaded within 12 months.

2) If you do not have an up-to-date LinkedIn profile, we provide a "survey" input form, where you are asked to provide data on (up to) your last three full-time work experiences. This includes the job title, timeframe, company size, sector, location, and important skills.

Do I have to take part?

No. Participation in this study is completely voluntary and choosing not to take part will not affect you in any way. You can also choose to withdraw your participation at any time, without giving a reason by contacting the research team.

What are the possible benefits of taking part in this study (collecting resumes)?

The benefits are the following:

- to see how the responses help to solve the workers to find a better job in Europe.
- Chance of winning a €1,000 prize

Expenses and payments

You will not receive economic consideration for participating. Participation is free.

Will my taking part be kept confidential?

The data will not only be modified so that it is not directly identifiable, but also be protected against re-identification. You can ask for information about what will happen to your data anytime.

What will happen to the data collected about me?

Your personnel data (your name, e-mail) that you shared in your CV will be deleted and replaced with a participant number after the prize winner is announced. This means that your data can not be found and connected to you. The key to identification will be stored separately and securely to safeguard your identity. TNO has in place policies and procedures to keep your data safe. This data will be stored safely for 5 years after closing this project.

Data Sharing

Only the researchers will get access to your resume/data.

Under the privacy law, you have right to keep control of your personal data. For example, you can correct/withdraw your personal data, if you want. You can find more information on your privacy at our website (link: [Privacy statement | TNO](#)). There you will also find the contact details of our Data Protection Officer.

What will happen if I don't want to carry on being part of this research and do not want you to use my resume?

You consent voluntarily to share your resume with us. However, you can refuse to participate to SkiLMeeT research project anytime you want, and you can withdraw your resume without giving a reason. There will be no consequences for you.

What will happen to the results of the study?

Based on the SkiLMeeT research, we will produce reports and (internet) articles that will be publicly available to everyone.

Who should I contact if I want further information?

(To be completed by the researcher)

The researcher's:

Name,

Address,

E-mail,

Tel no :

Who should I contact if I wish to make a complaint?

Any complaint about the way you have been dealt or any possible harm you might have suffered during our research, can be addressed to the person below, who is the project leader of SkiLMeeT:

Suhendan Adigüzel van Zoelen

TNO, Innovation for Life

Sylviusweg 71

2333 BE Leiden

The Netherlands

Email: suhendan.adiguzel@tno.nl

If you wish to raise a complaint on how we have handled your personal data, you can contact TNO Data Protection Officer, [Remy van den Boom | TNO](#), who will investigate the matter.

Thank you for taking the time to read this Participant Information Sheet.

Annex 2. Participants Information Sheet for interview participants

You are invited to take part in a research project called as SkilMeeT which stands for "**S**kills for **L**abour **M**arkets in the Green and Digital **T**ransition". Before you decide to join, you need to understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully. Talk to others about the study if you wish.

Please ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the study about and who is organising and funding the study?

In SkilMeeT, we investigate what skills workers have and to what extent these skills are in demand in Europe. This allows us to analyze where skills shortages and skills mismatches occur in Europe and how these can be resolved (by job and career transitions, reskilling or upskilling). Special attention is paid to the digital and green transitions because significant employment growth is expected there. SkilMeeT provides insights into how we can equip workers with the skills they need now and in the future for the digital and green transition across Europe.

TNO is organizing this research by using European Union funds.

What would taking part involve?

During the interviews, we require you to prepare for the interview. We use the interview data to investigate what skills are needed for your job, what education and training you have completed, and what job and career changes you have undergone. We use this information to analyze skills shortages and mismatches in Europe and identify possible solutions (job and career transitions, reskilling or upskilling). If needed, we will ask you to respond to (anonymized) digital surveys during the interview.

In 2025 and 2026, interviews will be organised with the workers related to their skills.

The interviews will be face-to-face or online. The expected duration of the interview is at least one hour.

Do I have to take part?

No. Participation in this study is completely voluntary and choosing not to take part will not affect you in any way. You can also choose to withdraw your participation at any time, without giving a reason by contacting the research team.

What are the possible benefit (s) of taking part in this study?

To help to the workers, employers and policymakers to find a better job / employee in Europe by keeping up to date with changing skills requirements, shortages and mismatch.

Expenses and payments

You will not receive economic consideration for participating. Participation is free.

Will my taking part be kept confidential?

The data will not only be modified, but also be protected against re-identification. You can ask for information about what will happen to your data anytime.

What will happen to the data collected about me?

Your personnel data (your name, e-mail address etc.) will be deleted immediately and replaced with a participant number. This means that your data can not be found and connected to you. The key to identification will be stored separately and securely to safeguard your identity. TNO has in place policies and procedures to keep your data safe. This data will be stored safely for 5 years after closing this project.

Data Sharing

Only the researchers will get access to your resume/data.

Under the privacy law, you have right to keep control of your personal data. For example, you can correct / withdraw your personal data, if you want. You can find more information on your privacy at our website (link: [Privacy statement | TNO](#)). There you will also find the contact details of our Data Protection Officer.

What will happen if I don't want to carry on being part of this research and do not want you to use my resume?

You consent voluntarily to have a interview with us. You can refuse to participate to SkiLMeeT research project anytime you want, and you can withdraw your information that you shared during the interview without giving a reason. There will be no consequences for you.

What will happen to the results of the study?

Based on the SkiLMeeT research, we will produce reports and (internet) articles that will be publicly available to everyone.

Who should I contact if I want further information?

(To be completed by the researcher)

The researcher's:

Name,

Address,

E-mail,

Tel no :

Who should I contact if I wish to make a complaint?

Any complaint about the way you have been dealt or any possible harm you might have suffered during our research, can be addressed to the person below, who is the project leader of SkiLMeeT:

Suhendan Adigüzel van Zoelen

TNO, Innovation for Life

Sylviusweg 71

2333 BE Leiden

The Netherlands

Email: suhendan.adiguzel@tno.nl

If you wish to raise a complaint on how we have handled your personal data, you can contact TNO Data Protection Officer, [Remy van den Boom | TNO](#), who will investigate the matter.

Thank you for taking the time to read this Participant Information Sheet.

Annex 3. Informed Consent Form

Please complete this form after you have read the Participant Information Sheet for SkiLMeeT project and/or listened to an explanation about the workshop/research/donating your resume.

Thank you for your interest in participating in the **SkiLMeeT** project. Before you agree to take part, the person organising the research must explain the project to you. If you have any questions arising from the information sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Participant's Statement

I declare that:

Please initiate all boxes

I have read the notes written above and the Information Sheet, and understand what the research involves. I have been given the opportunity to ask questions and have had them answered to my satisfaction.

☐

I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason immediately without any consequences.

☐

I have been given the information about the expected duration of the participation and that personal data will not be held for a period of no longer than 5 years after the completion of the project.

☐

I consent to the processing of my personal information for the assessment of my participation in SkiLMeeT research project.

☐

I agree that the research project named above have been explained to me to my satisfaction and I agree to take part in this study.

☐

I understand that the information I have submitted will be published, as a report, scientific publication, book or other dissemination and communication outputs. Confidentiality will be maintained and it will not be possible to identify me from any publications.

☐

I agree that my non-personal research data may be used by others for future research. I am assured that the confidentiality of my personal data will be upheld through the removal of identifiers.

☐

I understand that under the privacy legislation, I have various rights. I keep control of my personal data. I have rights to access and correct my personal data. I can ask not to use my data at any time without any consequences. I can find more information on my privacy at TNO website (link: [Remy van den Boom | TNO](#)). I can also find the contact details of Data Protection Officer of TNO.

☐

Signatures

Name of participant [IN CAPITALS]

Signature

Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher [IN CAPITALS]

Signature

Date



Skills for labour markets in the digital and green transition

SkiLMeeT is a research project carried out by eight research institutions, exploring how the digital and green transformation of European economies are changing the demand for skills. We analyse the scope of skills shortages and mismatches, identify their drivers and indicators to propose innovative ways to reduce skills gaps.

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 twitter.com/SkiLMeeT
www.skilmeet.eu



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SkiLMeeT Partners:

