

D2.3 Monitoring methodologies





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1. Monitoring the effectiveness of START2ACT's actions

1.1 Introduction

START2ACT aims to reduce residential energy consumption in the EU via changing the behaviour of consumers in their everyday lives by approaching them at their workplace. With a focus on European startups and young SMEs, the project aims at triggering action by young entrepreneurs and their emerging enterprises as well as by the owners and staff of young SMEs to introduce energy efficiency measures within their daily routines. Even though each startup and SME consumes relatively small energy amounts, the collective environmental impact of 20 million SMEs in the EU is massive, contributing to 64% of environmental impact. Active engagement of startups and young SMEs is essential in order to reach the 2030 Energy Strategy and there is market potential for almost all enterprises to cost effectively reduce their energy consumption.

The young SMEs that are approached in the START2ACT project have a maximum of 50 employees and have been operating for no longer than 5 years. Startups are defined as independent, unlisted, innovative, tech enabled, scalable enterprises designed by intent from day one to become a large company — by either disrupting an existing market and taking customers from existing companies or by creating a new market — aiming to provide significant returns to their founders and investors using all available outside resources.¹

An important part of the START2ACT approach is to facilitate behavioural change by understanding the motivations, attitudes and knowledge levels of managers and employees of young SMEs and startups. These will also be monitored longitudinally so that the impact of training and mentoring programmes over time can be evaluated.

The aim of this report within Work package 2 (WP2) is to explain the monitoring activities in START2ACT. First, in Chapter 1 the theoretical model is briefly introduced (more details can be found in report D2.1 Baseline Assessment Report) and a short recap of the baseline survey is provided on which the monitoring surveys are built. Chapter 2 explains how the mentoring and training activities throughout the project take place and how the monitoring surveys build on previous tasks and provide further input into the monitoring activities by the project partners. In Chapter 3, the exchange of knowledge and feedback is discussed. Finally, the appendix shows the questionnaire.

1.2 Energy efficient behaviour

Energy efficient behaviour depends on many aspects. Two widely applied theoretical frameworks for explaining behaviour and behaviour change are the Theory of Planned Behaviour (TPB) and the Value-Belief-Norm theory (VBN).² These theories have also been applied to energy efficiency.^{3,4} The model we describe integrates aspects from both theories applied to energy efficiency. The model is displayed in Figure 2.1 and was taken as a starting

¹ Definition from Startups Belgium.

² Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Action control (pp. 11-39). Springer Berlin Heidelberg.

³ Abrahamse, W., & Steg, L. (2011). Factors related to household energy use and intention to reduce it: The role of psychological and socio-demographic variables. *Human Ecology Review*, 18(1), 30-40.

⁴ Dixon, G. N., Deline, M. B., McComas, K., Chambliss, L., & Hoffmann, M. (2015). Saving energy at the workplace: The salience of behavioral antecedents and sense of community. *Energy Research & Social Science*, 6, 121-127.

point for developing the surveys in START2ACT. The model is explained in more detail in report D2.1. Below a short summary of the model is presented.

On the right side of the model the ‘desired’ **behaviour** – conserving energy – is displayed. Within START2ACT, energy efficient behaviour applies to both behaving energy efficiently in the office, during work time, and the potential spill-over of energy efficient behaviour at home.

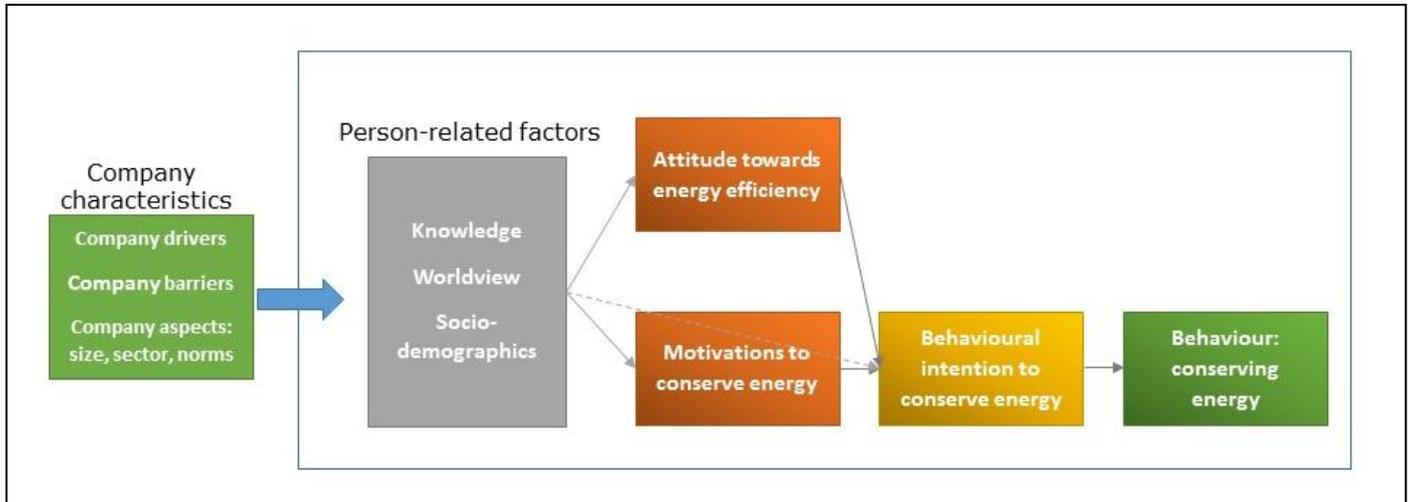


Figure 2.1: Model to explain energy efficiency behaviour – or the lack thereof (based on TPB).

Behavioural intentions can be seen as the closest predictor to perform the behaviour. Behavioural intentions are an indication of the extent to which people are willing to perform the behaviour (in the future). In the current study, information on energy usage will be collected via energy bills to have the actual energy usage, and by asking questions about self-reported behaviour and future behavioural intentions.

Behavioural intentions are in turn influenced by **attitudes** and **motivations** to conserve energy. Attitudes refer to the degree to which a person has a favourable or unfavourable evaluation towards energy efficiency. Motivations refer to the degree to which a person is motivated to perform energy efficient behaviour.

Furthermore, attitudes and motivations are influenced by **person-related factors**, such as:

- knowledge about (the importance of) energy efficiency;
- worldview: general values such as environmental concern, self-expectation on energy efficiency and the ease or difficulty to engage in this behaviour;
- socio-demographics.

In the current context of behaviour change among employees of startups and SMEs it is also of key importance to take into account **company characteristics**, such as:

- company drivers;
- company barriers;
- company-specific aspects, such as the size and sector of the company and company norms.

1.3 The baseline survey

A baseline survey was conducted amongst young SMEs and startups between 9 August and 31 October 2016 (see D2.1). This questionnaire was meant to provide a baseline overview of the general state of the nation in the targeted nine START2ACT countries. This questionnaire was sent to a wide selection of SMEs and startups in each country. The questionnaire focussed on company characteristics in energy saving behaviour, such as the company drivers of and barriers to behavioural change, and attitudes and motivations of individual employees. Furthermore, awareness of available tools and requirements regarding the “to be developed” tools within START2ACT were investigated. The results of the survey provided a state of the nation baseline and were used to inform / optimise content for WP3, 4, and 5. Contrary to the baseline survey, energy efficiency behaviour and behavioural intentions are more central in the monitoring surveys, to gain insight in the effectivity of the trainings.

1.4 Monitoring surveys

Startups will be invited to a mentoring workshop. At the end of the workshop, they will participate in the survey. These workshops will take place between May 2017 and November 2018. For startups, the questionnaire will be made available in English in all of the targeted countries. We have considered that this should not be an issue as employees of startups are highly educated and communication and outreach often takes place in English. Moreover, in case there are issues with filling in the questionnaire there is always a local trainer present for help.

The monitoring surveys will be administered on a periodic basis among employees of SMEs that are engaged in the START2ACT trainings. For SMEs there will be three training sessions. The first monitoring survey takes place prior to the first training and provides a baseline of the target group to which the follow-up surveys can be compared (see table 2.1). The second monitoring survey takes place after the second training, and the third monitoring survey after the third training. The content of the surveys will be similar in all surveys, except that in the monitoring surveys some evaluation questions will be added regarding the training sessions. Keeping the surveys constant allows us to investigate whether attitudes, motivations and behaviour become more focussed on energy efficiency throughout the START2ACT project. This provides insights on whether it is necessary to further adjust the content (modules) throughout the training sessions.

The time period in which the different training activities take place is quite broad (see table 1.2). Therefore, CentERdata will deliver one survey link to the local partners so that they can determine the timing of the surveys themselves as well as their strategy on how to approach the companies. The survey will be made available in the local language and in English (a European version in which the respondents need to indicate from which country they are).

Table 1.2: Timing of the surveys for SMEs.

Survey	Timing	Indicative time period
Baseline monitoring survey target group	Before first training	April – October 2017
First monitoring survey	After first training	April – October 2017
Second monitoring survey	After second training	October 2017 – May 2018
Third monitoring survey	After third training	May 2018 – November 2018

2. Methodology

2.1 Sample and recruitment

Recruiting of respondents is arranged via the networks of the local project partners (GEO, CT, ENVIROS, EHIP, SOFENA, SIEA, ENERO, KAPE, SB). The sample will consist of companies in a range of industries and sizes.

The survey is developed by CentERdata and data will be collected via a hosting organised by CentERdata. CentERdata will create one survey link per local partner, which the local partners can further distribute within their networks. In the data files for each respondent, a personal code is generated which will be connected to identifying variables such as their email address, gender and age. The same codes will be assigned to the same individuals for every follow-up survey, so that a longitudinal dataset can be generated. Merging the data files from the different surveys will be based on two identifying variables: the company name and the e-mail address of the respondent. It will be explicitly communicated to respondents that the same e-mail address must be used as the one to which the invitation was sent. Because the data files will be merged, it is also not necessary to ask background questions regarding the company and socio-demographics in the monitoring surveys.

2.2 Survey content

The survey will consist of questions regarding personal motivations, attitudes, current behaviour and future behavioural intentions at home and at work (see table 2.1). Furthermore, some company characteristics and socio-demographics will be measured. As startups only participate in one workshop, the impact – the effectiveness of the workshop – on energy efficient behaviour will be measured once.

For SMEs there will be four short surveys. A large part of the surveys will overlap so that longitudinal comparisons can be made: Did the attitudes and behaviour of respondents change over time? In the SME survey, company motivations are also measured. Moreover, the survey will link soft survey data (on attitudes and motivations, etc.) to hard indicators (such as actual energy usage as provided on energy bills), where possible. Finally, in the monitoring surveys, which take place after each training session, the effectiveness of the training on energy efficient behaviour will be evaluated. Appendix A provides an overview of the survey questions.

Table 2.1: Survey topics.

Survey	Topics
Survey for startups	Personal motivations, attitudes, current behaviour and behavioural intentions at home and at work, company characteristics and socio-demographics + workshop evaluation
SME Baseline survey target group	<u>Company motivations</u> , personal motivations, attitudes, subjective knowledge, current behaviour and behavioural intentions at home and at work, <u>hard indicators</u> , company characteristics and socio-demographics
SME First monitoring survey	Baseline + training evaluation (effectiveness)
SME Second monitoring survey	Baseline + training evaluation (effectiveness)
SME Third monitoring survey	Baseline + training evaluation (effectiveness)

3. Exchange of knowledge and feedback

An important part within START2ACT is the frequent exchange of knowledge and feedback within project partners and SMEs. This feedback loop is very valuable as it allows to constantly sharpen the trainings. At the same time there are some challenges:

- The timing of the surveys largely depends on the schedules of the local partners. For instance, some SMEs will receive the baseline survey and training in May 2017, quickly followed by the first monitoring survey in June 2017. Other SMEs however might not have received the baseline survey by June 2017.
- The number of surveys that will be administered in the next 1.5 years is expected to be 1,800: four questionnaires (baseline and three monitoring surveys) among 50 SMEs in nine countries. Providing updates on the survey progress prior to each training per SME per country for 3 questionnaires represents a great challenge as this requires 1,350 separate data preparation and analysis rounds (for the last questionnaire this will not be necessary).

Therefore, CentERdata aims to provide monthly updates on the survey response and progress to the project partners on every last Friday of the month. CentERdata will provide an Excel sheet with an update on the survey response and main outcomes. For instance, the scores (e.g. percentages or averages) on the most relevant items will be provided. This update consists of the survey response of all SMEs that participated until that point in time. The local project partners can use this input to prepare their company visits. In order to achieve this, CentERdata will develop a partially automated work process.

The Excel sheet will consist of separate tabs for each country and one overview tab with the average survey response across countries. Figure 3.1 provides an example of an Excel tab. At the top of the Excel tab, general information is provided on the project background such as the date on which the overview is created and which questionnaire (baseline or monitoring) it concerns.

Next, general sample statistics are provided on the number of SMEs and respondents that participated. Also, socio-demographic characteristics such as gender, age, education level and average length of employment are provided, aggregated on country level. These are provided on an aggregated level so that no survey responses can be traced back to a certain individual. For instance, if there is an SME with only one survey response, it can be quite easy to deduce to which person this socio-demographic information belongs (if this is presented at the company level). This is especially problematic if, in this way, it is revealed that a person for instance is not very motivated to conserve energy.

The second part of the Excel tab provides an overview of the means to the most relevant items in the questionnaire. For each company a separate column is created. The final column displays the average across the companies that participated. In this way, the company can be compared to the country average.



Project:	START2ACT			
Country:	UK			
Date:	15/01/2017			
SME Questionnaire (1 = baseline, 2 = first monitoring, 3 = 2nd monitoring, 4 = 3rd n	1			
# of SME's participated	3			
# of respondents participated	16			
# of respondents who did not agree to participate	1			
Gender	<i>Male</i>	<i>Female</i>		
	10	5		
Age	41.50			
Average education level	<i>Primary</i>	<i>Intermediate</i>	<i>Higher secondary</i>	<i>Intermediate vocational</i>
	1.60%	0.80%	4.00%	1.60%
Average length of employment	5.5			
	Company name 1	company name 2	company name 3	Average across companie
Number of records	7	2	3	3.67
Company size	25	15	30	18.33
Energy saving is not a priority in my company.	2.1	1.7	3.5	1.83
The cost savings are not sufficient to justify the effort.	3	4	1	3.67
We dont pay the energy bill so wouldnt see the benefit of savings.	5	2	4.5	3.00
It is worth paying a little more for a more energy efficient product	4.7	3	2.8	3.57
Conserving energy is not my problem	1.3	1.2	3.5	1.23
I consider it important to help my company to conserve energy	2	2.5	4.5	2.33
I am well informed on how to save energy	1.8	1.9	2.9	1.87

Figure 3.1: Example of excel template.



Appendix

NOTE: startups will receive the questionnaire below without question 1, 2, and 7. Evaluation questions will be added (Q10). Also, the italic parts in the introduction will be removed.

SMEs will receive the same questionnaire after each training session. Compared to the baseline questionnaire, in the monitoring surveys the background questions about the company and person-specific characteristics will not be asked again. Q10 will be added to the questionnaire. Also, the introduction will slightly be adjusted. The hard indicator question will be asked prior to the start of the training and after the last training session.

A.1 General questionnaire

[introduction screen]

Welcome.

Thank you for participating in this START2ACTquestionnaire [mouse roll-over 1].

The purpose of this questionnaire is to monitor the effectiveness of the START2ACT activities in which you are participating. *We will send follow-up questionnaires after each training activity to track your energy efficiency progress throughout your participation in the programme.*

If you are the manager of your company, we ask you to have information on your energy costs ready. START2ACT hopes to track the actual energy savings achieved by participants over the course of the programme. This will also help your organisation to define the success of the trainings you received in terms of energy monetary savings. If you do not have access to this information you can skip this step.

Your data will be kept confidential and will not be provided to third parties.

Thank you in advance for your help!

On behalf of the START2ACT team,

CentERdata and [local partner]

Once you have read the text and agree to participate in START2ACT, please click the box below and press the 'next' button to start the first questionnaire. If you do not agree to participate, please indicate so.

- I agree to participate
- I do not agree to participate

[mouse roll-over 1: START2ACT is a three-year project supported by the European Union's Horizon 2020 programme for research and innovation under Grant Agreement No. 696069.]

[if respondents do not agree to participate, the following screen appears]

You indicated that you do not want to participate in this questionnaire. By clicking the 'Next' button you will leave the questionnaire, and you will not be able to fill it out at a later time.

If you want to return to the questionnaire please click 'Previous' and change your answer.



[q1] To what extent do you think the following options would motivate your company to implement energy efficiency measures? Please indicate your top 3 (1st, 2nd, 3rd).

	1	2	3
Reduction of energy bills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being prepared for future increases in energy prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributing to the fight against climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved company image	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved product quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, namely...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[q1a if, other, namely: text box appears]

You indicated that other options would motivate your company to implement energy efficiency measures. Which other options(s) do you consider? [open textbox]

[q2]

To what extent do you agree with the following statements?

	Strongly disagree		Neutral		Strongly Agree
Energy saving is not a priority in my company.	1	2	3	4	5
The cost savings from energy efficiency are not sufficient to justify the effort.	1	2	3	4	5
By saving energy, me and my colleagues can contribute to lowering the energy bill of the company.	1	2	3	4	5

[q3]

To what extent do you agree with the following statements?

	Strongly disagree		Neutral		Strongly Agree
It is worth paying a little more for a more energy efficient product.	1	2	3	4	5
I consider it important to help my company to conserve energy.	1	2	3	4	5
I am well informed on how to save energy.	1	2	3	4	5
It is the company norm to switch off office equipment (e.g. PCs, lights) when not in use.	1	2	3	4	5



[q4] Please indicate how likely it is that you will do the following:

	Not likely at all	1	2	3	4	Very likely
I currently try to conserve energy at work.	1	2	3	4	5	
I encourage my colleagues to behave in an environmentally friendly way.	1	2	3	4	5	
In the next few months I will take more actions to conserve energy at work than I currently do.	1	2	3	4	5	
I currently try to conserve energy at home.	1	2	3	4	5	
I encourage my family and friends to behave in an environmentally friendly way.	1	2	3	4	5	
In the next few months I will take more actions to conserve energy at home than I currently do.	1	2	3	4	5	

[q5] Please indicate whether you do, or do not do the following:

	never	rarely	sometimes	often	always	N/A*
When I have finished using my computer for the day, I turn it off.	<input type="radio"/>					
When I leave a room in a work area that is unoccupied, I turn off the lights.	<input type="radio"/>					
When I am not using my computer, I turn off the monitor.	<input type="radio"/>					
I print documents that are essential to have in hard copy form, and store and read all other documents electronically.	<input type="radio"/>					
I turn down the heating/air-conditioner when I leave the room/building at last.	<input type="radio"/>					

* e.g. when this turns off automatically or is centrally controlled.

[q6] Please indicate whether you do, or not do the following actions at home:

	never	rarely	sometimes	often	always	N/A
When I have finished using my computer at home , I turn it off.	<input type="radio"/>					
When I leave a room at home that is unoccupied, I turn off the lights.	<input type="radio"/>					
When I am feeling cold at home I put on a jumper rather than turning up the heating straight away.	<input type="radio"/>					
When I leave home, I turn down the heating/ air-conditioner	<input type="radio"/>					

[q7] The following question addresses managers/directors, namely those who oversee the company's day-to-day business operations and are in charge of decision making.



Are you the energy manager / START2ACT contact person?

- Yes
- No

If yes continue with hard indicator question q7a. If no, continue to general questions.

[q7a] What was the energy cost during the past year?

In order to easily answer this question you will need to have this information ready (i.e. in the form of energy bills).

Note that if you close the browser of this questionnaire before you finished the questionnaire, all data will be lost and you would have to start again if you want to finish the questionnaire. Moreover, the questionnaire will time out in one hour, so if you need to look up the information needed for this question, make sure you do so within one hour. Otherwise you would have to start again as well.

If you do not have access to this information you can skip this step.

Instructions

You can type in the information in numbers. If you do not know the exact amount of energy used, please provide a rough estimation of the energy cost. You only need to enter the amount **OR** the cost. Please also indicate whether these are actual or estimated costs/amounts by ticking the corresponding box.

	Energy amount	Energy costs (in Euros)	Actual	Estimate	N/A
Electricity (kWh)	Open textbox	Open textbox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas (kWh)	Open textbox	Open textbox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil (litres)	Open textbox	Open textbox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (e.g. biomass, coal)	Open textbox	Open textbox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In case it is difficult to provide the information in the format above you can provide the information that you do have here: [open textbox]

[general questions]

[q8a] Finally, we have some general questions for you. Please note that your data will be kept confidential and will not be provided to third parties.

What is the name of your company?

[open textbox]

[q8b] What is the size of the company in terms of personnel? Please provide a numerical value.

- 0-10 persons
- 11-25 persons
- 26-50 persons
- > 50 persons





[q8c] Does your company have a permanent office/site?

- Our company owns a permanent office/site.
- Our company rents a permanent office/site.
- Our company works from home.
- Our company makes use of co-working spaces.

[q8d]

How long has your company been operational?

- <3 years
- 3-5 years
- 5-8 years
- > 8 years

[screen 2 general questions]

[q9a] What is your age?

- 18 - 24 years
- 25 - 34 years
- 35 - 44 years
- 45 - 54 years
- 55 - 64 years
- 65 years and older

[q9b] What is your level of education?

- primary school
- intermediate secondary education (e.g. junior high school)
- higher secondary education/preparatory university education (e.g. senior high school)
- intermediate vocational education (e.g. junior college)
- higher vocational education (e.g. college)
- university
- prefer not to say

[q9c] What is your e-mail address? Please fill in the same e-mail address to which the invitation for the workshop / training was sent.

[open textbox]





[q9d] Do you have any questions/comments about the questionnaire?

- Yes
- No

If yes -> open textbox appears. If no, go to outro.

[outro]

Thank you for participating in the START2ACT questionnaire.

If you do not want to participate in the next questionnaire please contact [local partner].

Please click the 'Next' button to submit your questionnaire.



A.2 Evaluation of the training

Q10 will be part of the startup questionnaire. For SMEs Q10 will be part of the questionnaire in survey 2, 3, 4.

[q10a]

	Certainly not				Certainly so
The training provided me with useful insights on energy efficiency.	1	2	3	4	5
The training provided me with new insights on energy efficiency.	1	2	3	4	5
I am planning to change my behaviour based on what I learned in the training.	1	2	3	4	5

[q10b]

	Strongly disagree		neutral		Strongly agree
The training will not have an impact on my energy efficiency behaviour at work.	1	2	3	4	5
The training will not have an impact on my energy efficiency behaviour at home.	1	2	3	4	5