

DELIVERABLE D.T1.2.8

H2020 GreenSoul solutions

Version 1 07/2020







D.T1.2.8: H2020 GreenSoul solutions

A.T1.2 Transferability assessment of past outcomes for adaptation, extension & deployment in new Pilot Areas

Issued by: Partner Nr. PP7

Version date: 07.2020

	Authors	
	Name (organization)	Name, e-mail
WP leader	Unione dei Comuni della Bassa Romagna	Valeria Rossi, rossiv@unione.labassaromagna.it
Contributing participants	Weizer Energie-Innovations-Zentrum GmbH	Gottfried Köberl gottfried.koeberl@innovationszentrum-weiz.at Rafael Bramreiter rafael.bramreiter@innovationszentrum-weiz.at





1. Introduction

The deliverable T1.2.8 belongs to the activity related to the transferability assessment of past project outcomes (A.T1.2). In particular, for each previously funded EE project/solution, a document has been created reporting the information on how the outcomes could be adapted, tailored, extended, and deployed in the new pilot areas to capitalize them and widespread their impact.

In the following section, the outcomes related to the H2020 *GreenSoul solutions* project are reported and future activities to be realised are described.

2. Adjustment of (non-technical solution) O.T 1.2 "H2020 GreenSoul solution"

2.1 Short description of the solution and its aim

The aim of the H2020 project GreenSoul (http://www.greensoul-h2020.eu) was to achieve higher energy efficiency in public buildings by altering the way people use energy consuming shared devices (like lights, printers, etc.) and personal devices (personal pluggable appliances). To achieve this goal, GreenSoul applied a strategy which persuaded users to increase their energy awareness and changed their energy consumption habits through a variety of techniques, from persuasive social application to physical interaction mechanisms linked to networked devices (Fig. 1). Also the "GreenSoul questionnaire" was developed for people working in public



buildings to represent their energy behaviour. In the GreenSoul project the questionnaire was used to provide statistics and conclusions (like which persuasion strategies are the most popular among responders) and to identify socio-economic factors that are important to determine certain persuasion strategies.





Figure 1: GreenSoul energy saving reminder (left)and devices setup (right).

2.2 Main needs of transferability

For Target-CE the GreenSoul questionnaire will be used to obtain comparable user data to determine if set intervention strategies have the intended impact on energy related user behaviour. Therefor in the participating pilot buildings 4 intervention groups will be formed. Depending on the accuracy of the available energy information from the pilot buildings, the intervention groups are defined at office, floor and/or building level. These 4 groups are: (1) feedback information via e-mail regarding the weekly/monthly energy consumption (if available on office, floor and/or building level); (2) energy saving sticker (at workspace / office entrance / light switches / printers / doors / ...); (3) combination of both interventions; (4) no interventions. Whether these interventions have the intended effect on the energy behaviour of the users is determined by comparing the results of the GreenSoul questionnaire at defined milestones.

For the pilot areas using GreenSoul solutions in Target-CE, just small adjustments have to be made. The GreenSoul questionnaires can be used as they were developed, with some small changes regarding the buildings in which they will be used in. Depending on necessity, the English version can be translated into the native language of the respective project partner. For the application of the intervention strategies to change the energy efficient behaviour some is information needed from the PP's / target buildings (PA's).





To determine how the 4 intervention groups should be set up, the layout of the building(s)/office(s) is necessary. Also, for the feedback intervention group, the energy consumption of the building must be available (ideally on room/office level), so a comparison of offices in one building in energy related behaviour can be carried out. If the energy consumption is not available at office/floor level, a comparison of intervention groups can only be done at building level.

The GreenSoul "energy saving sticker" (Fig. 2) intervention strategy can be applied without change. No additional adjustments are necessary, only the correct placement of the stickers for the different intervention groups has to be carefully considered.

The GreenSoul App was discontinued at the end of the GreenSoul project, but if the energy consumption of the building (floor/office) is provided by the PP / target building, an adjusted intervention strategy can be used by sending an e-mail regarding the energy consumption of the last week/month to create feedback about and encourage energy efficient behaviour.

Other parts from GreenSoul, like the GreenSoul-ed devices, cannot be used for Target-CE as intervention strategies because these applications were cancelled after the end of the GreenSoul project.







Figure 2: Examples for energy saving stickers used in the office.

2.3 Adjustments/barriers for the future:

The used intervention strategies potentially increase the awareness towards energy efficient behaviour but after a while the strategies lose their appeal. To prevent this, the used intervention strategies should be updated/renewed after a certain period of time.

3. Implementation of GreenSoul deliverable

To use the GreenSoul outputs in TARGET-CE, the following procedure was developed for all project partners interested in it. In 07/2020 all interested project partners will be provided with the slightly adapted form of the GreenSoul questionnaire in English. Then, if necessary, the GreenSoul questionnaire will be translated by the project partners. Simultaneously, depending on the layout of the used pilot buildings, 4 intervention groups are formed. After the translation is finished the questionnaire can be given to the interested partners and to the users in the pilot buildings. This questionnaire will then be filled in by the persons in the participating pilot buildings. This can either happen through an online version of the questionnaire in GoogleForms or in Paper/Pencil form for visitors and/or people who are not comfortable with the online version of the questionnaire. When the questionnaires have been completed for the 1st time, the interventions can be deployed and the intervention phase can begin. At a defined milestone point (approximately 6 months after the 1st time) the GreenSoul questionnaire will be deployed a 2nd time, and a 3rd and last time 12 months after the 1st time. Meanwhile the data from the different measuring points of the GreenSoul questionnaires will be collected and the data from the online and offline questionnaires will be combined into one dataset. This dataset will then be statistically analysed by PP7 to create the necessary user profiles and a comparison between the times of measurement in energy related behaviour. This analysis will determine if the set interventions were able to change the energy efficient behaviour among the participating users.





Table 1: Action plan for GreenSoul outputs in Target-CE.

time	action	necessary data from PP/PA	Additional information
07/2020	provide GreenSoul questionnaire to PP		
07/2020-11/2020	Translation in native language of PP (if necessary)		Translation done by PP
07/2020-11/2020	Determine 4 intervention groups for pilot buildings (if possible on room level)	Energy consumption of rooms/floors/buildings to provide feedback about energy usage	
07/2020-11/2020	GreenSoul questionnaire 1 st time		after this ② setup interventions (sticker, info mail about energy consumption)
07/2020-11/2020	Setup intervention groups	Contact information for feedback intervention groups	If possible in different offices to have a comparable sample in the same building
12/2020	Analyse GreenSoul data 1 st time	Completed 1 st GS questionnaires from PP/PA's	
05/2021	GreenSoul questionnaire 2 nd time		
06/2021	Analyse GreenSoul data 2 nd time	Completed 2 nd GS questionnaires from PP/PA's	
11/2021	GreenSoul questionnaire 3 rd time		
12/2021	Analyse GreenSoul data 3 rd time	All completed GS questionnaires from PP/PA's	
01/2022	Complete statistical analysis of the GreenSoul questionnaires and report of the findings		





4. Conclusions

The GreenSoul solutions used in Target-CE can be an easy, simple and effective way to change people's behaviour towards energy efficiency in public buildings. The set intervention strategies should be easy to implement and use in public buildings, if the necessary energy data is available. Even visitors should be influenced in their behaviour by the set interventions. But the results are always depending on the willingness to change one's behaviour and how much attention is paid to the intervention strategies. Also after some time the set interventions may lose their appeal and the interventions should be exchanged with new ones.





5. Appendix

GreenSoul project: Questionnaire for data collection on users' behaviour

Scope:

- (i) Analyse clusters/ classifications of end-user profiles;
- (ii) Assess socio-economic factors affecting end-user behaviour on energy use and consumption;
- (iii) Assess the potential effect of behaviour change techniques on end-users.

Structure:

- a) Part 1: User profile
 - a. Socio-demographics
 - b. Employment profile and building use
 - c. Self-perception on decision making about energy
 - d. Energy-related knowledge and perception of energy management in your company
 - e. Self-assessment of energy related attitudes and intentions
- b) Part 2: User daily energy-related routine at workplace
 - a. Energy specific behaviour at workplace
 - b. Dilemmas related to energy efficiency
- c) Part 3: Disposal to influence peers or be influenced by them

Target groups:

End-users	Energy managers				
Full time employee	Building/ facility manager				
Part time employee	Energy experts on public				
Tenant/ self-employed (a space within the building is rented by you for self-	buildings				
working)	Other(?)				
Principal researcher/head of unit/boss					
Administrative staff (including Secretaries or receptionists)					
Cleaning staff					
Caretaker/ concierge					
Visitor					
Student					

Desired time to fill in: 15-20'

Completion: Anonymous





Introductory message for the questionnaire

By participating in our survey you will help us better understand how human behaviour in public buildings can affect energy consumption. If you are a user of a public building (visitor or employee) please fill in the present questionnaire. This study will focus on energy-behaviour of public building users (employees & visitors). It is known that individual energy-consumption behaviour patterns in public buildings are different from individual behaviour patterns in residential buildings.

All questionnaires are anonymised and will be used for the sole purpose of research within the Target-CE project. If there are any questions that you do not feel comfortable answering or you do not find an appropriate option for your answers, please leave it blank.

Part 1.a: Profile: General information - socio-demographics

-	1.a.1 Age group:
	□ <21
	□ 22-40
	☐ 41-52
	□ 53-71 □
	□ 72+
_	1.a.2 Gender:
_	☐ Female
	☐ Male
	☐ Diverse
	_ Diverse
_	1.a.3 Children:
	☐ Yes
	□ No
-	1.a.4 Education:
	☐ None
	☐ High-school /secondary
	☐ Post-secondary (non-university)
	☐ University degree (bachelor or equivalent)
	☐ Post-graduate (master or equivalent)
	☐ Doctoral degree (PhD or equivalent)
	1 a F Country
-	1.a.5 Country: ☐ Austria
	☐ Croatia
	☐ Czech Republic
	☐ Italy
	☐ Poland
	☐ Slovenia
	☐ Other, please specify
	— / F /
-	1.a.6 City/Building: please specify
_	1.a.7 Intervention group (1 to 4)





Part 1.b: Profile: Employment profile and building use

-	1.b.1 Current employment status
	☐ Full time employee
	☐ Part time employee
_	1.b.2 Position
	☐ Employee
	☐ Tenant / self-employed (a space within the building is rented by you for self-working)
	☐ Principal researcher / head of unit/boss
	☐ Administrative staff (including secretaries or receptionists)
	☐ Cleaning staff
	☐ Caretaker / concierge
	□ Visitor
	☐ Student
	☐ Other
-	1.b.3 Which of the following best describes your office/ team/ department culture: (you can
	check only one option)
	☐ Teamwork, participation, sharing
	☐ Get the job done and goal-oriented
	☐ Encourage creativity, experimentation and risk taking
	☐ Formal and hierarchical (I work on my own)
	☐ None of them
-	1.b.4 What floor do you work on?
	☐ Ground floor
	☐ 1 st floor
	☐ 2 nd floor
	☐ 3 rd floor
	☐ 4 th floor+
-	1.b.5 Number of colleagues with whom you share your office, work-desk area, or co-working
	space (your near colleagues & neighbours not the whole office building)
	□ 0 (Alone)
	□ 1-2
	□ 3-5
	☐ 6-10
	☐ 11-15
	☐ 16+
_	1.b.6 On a typical day, what percentage of your working time do you spend in your office/ work-
	desk space?
	□ 0-20%
	□ 21-40%
	□ 41-50%
	□ 51-70%
	□ 71%+
	□ /±/v'

- 1.b.7 Are you satisfied with your thermal comfort at your workplace?





	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Winter season	?	?	?	?	?
Summer season	?	?	?	?	?

Part 1.c: Self-perception on decision making about energy

- 1.c.1 Please, read the following statements regarding decision making on energy-related issues in your work space and choose how often you think you apply each of them at workplace

	Never	Very rarely	Rarely	Often	Very often
I make 'good enough' choices rather than expending effort in trying to 'optimise' my energy-related choices.					
I do the same thing each time and the same stimulus is applied to me in relation to energy consumption. I do not think too much about any decisions related to energy. I focus on doing my work and no more.					
In relation to energy consumption I think about what I do and I try to provide the 'why' analytically. I set and modify my own goals. I learn from mistakes (mine and those of others) and I change my behaviour accordingly.					

- 1.c.2 Please, evaluate the next statements related to energy management at work

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
I hardly pay attention to physical changes or notifications at my workplace that are not directly related to my work					
I prefer following my peers to take decisions					
I look for data to take my everyday decisions					
I prefer full system automation than taking decisions					
Prompts are what work for me to take action					
I don't see myself following an advice from others without self-reflecting in advance					





Part 1.d: Energy-related knowledge and perception of energy management in your organisation

 □ Lights □ Heating, ventilation and air □ Elevators □ Personal devices (Laptops, □ Shared devices (e.g. printer □ Small appliances (e.g. coffe □ Data servers 	PCs and more, copiers, ee makers, l	onitors) projectors kettles, etc	s, etc.)											
 □ Elevators □ Personal devices (Laptops, □ Shared devices (e.g. printer □ Small appliances (e.g. coffer □ Data servers 	PCs and more, copiers, ee makers, l	onitors) projectors kettles, etc	s, etc.)											
 ○ Shared devices (e.g. printer ○ Small appliances (e.g. coffer ○ Data servers 	rs, copiers, ee makers, l	projectors kettles, etc	· -											
○ ☐ Small appliances (e.g. coffe○ ☐ Data servers	ee makers, l	kettles, etc	· -											
○ □ Data servers			c.)											
	tatements i													
- 1.d.2 Please evaluate the following st	tatements i													
		in relation Strongly disagree	to your orga	Neither agree or disagree	Agree	Strongly agree								
very individual and organisation must dehate in improving energy efficiency	o their													
Our organisation cannot do much for better efficiency	energy													
nergy efficiency has several advantages organisation	for our													
t is important to approach energy eff ystematically in the workplace	iciency													





Part 1.e: Self-assessment of energy related intentions - 1.e.1 Please, evaluate these statements:

0	I am actually changing my ene	rgy intensive hab	oits and saving er	nergy right now.	
	☐ Strongly disagree	□ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	My behavioural choices somet	imes have a neg	ative impact on e	energy efficiency	
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Modern science will solve our		roblems.		
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	It is a waste of time thinking al	bout energy savi	ngs.		
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I enjoy living as I please, but so	ometimes my bel	naviours are harr	mful to the enerย	gy efficiency.
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Sometimes I think I should cut	down on my wa	steful behaviour		
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I am at the stage where I shou	ld think about be	eing more active	in reducing ener	gy consumption.
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I have just recently changed m	y environmenta	ly energy related	d harmful habits.	
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I don't think I behave in ways t	hat cause too m	uch harm to the	energy efficiency	у.
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Trying to live in a more energy	sustainable mar	nner would be po	ointless for me.	
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I am trying to engage in less er	nvironmentally e	nergy-related ha	rmful behaviour	s than I used to.
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Modern science will NOT be al	ole to solve our e	energy-related pr	oblems.	
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	With respect to the energy eff	iciency, there is I	no need for me t	o think about ch	anging my daily behaviours
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Anyone can talk about wanting	g to do somethin	g about the ener	gy efficiency, bu	t I am actually doing
	something about it.				
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree





Part 2.a: Energy-specific behaviour at workplace

answer that is most a Every time I need Once a week Once a month Once a year	pplicable to	-	ing sys	tem at your	workplacer (Please choose th	е
						N	Never
- 2.a.2 For you, what w	ould be the	e ideal temp	eratur	e?			
☐ Heating (winter)☐ Air conditioning (: °C]	□Autor	mation shou		that □I don't k that □I don't k	
curtains, etc. I am too busy etc.	dim lights was daylight had daylight had daylight had been seen as the lights:	when appropels keep and the with oth automation	oriate Idequat er thing techno	e indoor il gs to be con blogy can be	luminance by acerned with acerned this personal transfer this personal transfer the second se	adjusting the b	linds,
for the following: (If o		t apply for y	ou, ple	ase leave it	blank):	<u> </u>	7
	Very difficult	Difficult	Ne	eutral	Easy	Very easy	
Heating temperature (winter)							
Cooling temperature							1
(summer)							
Illuminance							
2.a.5 When do you us Only to go do To climb one To climb 2 flo I always use t	wnstairs floor ors or more he stairs		the elev	vator?			
- 2.a.6 Printing habits: I avoid printing when ☐ Never ☐ Ra I would accept a de efficiency ☐ Strongly disagree	rely [Play in the p	☐ Sometime printing time				nat enhances en rongly Agree	ergy-
- 2.a.7 Habits in your o	_	<u> </u>			-		1
	Never	Rar	ely	Sometime	s Often	Always	





INI	RAL LUROPL	Develop
1	TARGET-CE	

Turn-on energy-			
efficient mode			
Switch-off the device			
when stop working			
Switch-off the device			
during (lunch) breaks			

Pa

(2.b.1 In the workplace: To what extent would you sacrifice your personal convenience and/or comfort to enhance energy efficiency in order to lower your environmental impact? Winter time: Would you accept a decrease in internal temperature setting? No, I would not compromise my comfort Yes, a slight decrease Yes, a moderate decrease Yes, a significant decrease 							
1	 Summer time: Would you accept an increase in internal temperature setting? No, I would not compromise my comfort Yes, a slight increase Yes, a moderate increase Yes, a significant increase 2.b.2 Would you change your 'dress code'/ clothing instead to use the HVAC to adapt your body to the indoor temperature and hence lowering environmental impact? (If one does not apply for 							
•	, , -	ase leave it bla	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Wear clothe	lighte s indoor	S						
		sual clothing						





Part 3: Self-evaluation about our disposal to influence peers or be influenced by them

- :	3.1 Please evaluate these state	ements			
0	Suggest ways to my colleague	s & co-workers t	o act in a more e	energy efficient r	manner.
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Discussing energy-related top	ics with my colle	agues.		
	☐ Strongly disagree	□ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Provide energy-related inform	ation (e.g. grey	literature, scient	ific papers, web	pages, etc.) to my
	colleagues.				
	☐ Strongly disagree	□ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Give praise to my colleagues f	or their energy e	efficient behavio	ur.	
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	What others say makes me to	rethink my attit	ude towards it		
	☐ Strongly disagree	□ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	I do not want to be influenced	l by others			
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	Even my friends have difficulti	ies trying to influ	ience me		
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
0	No one can tell me what to do)			
	☐ Strongly disagree	☐ Disagree	☐ Neutral	☐ Agree	☐ Strongly Agree
t 4:	Persuasion				

Par

- 4.1 Assume that the organisation you work for has just launched an initiative to reduce energy consumption. You can join on a voluntary basis and save energy by changing your behaviour in line with the simple tips and instructions you receive. What would you do?
 - 2 Join immediately
 - 2 Discuss first with colleagues and then decide
 - 2 Join after a while
 - Do not participate





- 4.2 Would it motivate you personally to improve your energy-related behaviour in the following cases?

	Strongly motivate d	Motivate d	Neutral	Demotivate d	Strongly demotivated	Not applicable
Public (social) recognition of your contribution to energy savings is provided						
Receive personal praise (privately) for your contribution to energy savings						
The support of the majority of your peers to improve energy efficient behaviour.						
Receive energy related information in a simple and aesthetically appealing way						
Receiving perks such as flexible working hours, skipping certain tasks, etc, as a reward for improving your energy performance.						
You and your team receive recognition for collectively achieving energy savings						
You receive information about the people behind energy-related data collection.						
You are assisted in setting, meeting and reviewing your own personal energy saving goals						
Your (top) managers are also committed to save energy.						
You can monitor & track your own energy performance in real-time.						
The overall energy saving goals are broken down into smaller easily achievable						
The feasibility of the proposed energy savings have been verified in other						



2-3 weekly weekly monthly



buildings similar to your						
workplace						
Energy related information						
is tailored to you and you						
are able to self-configure						
some parameters (e.g. data						
provided, frequency, etc.)						
according to your						
preferences.						
- 4.3 What kind of i performance? (PI Information on the Not at Comparative asses	ease, rank ea e actual effec all useful ssment of you	ach of the fol t that your p \(\subseteq \text{Not usef} ur actual ene	llowing state otential action ful	ements) ons may have useral Useance compared	pon the energy c ful	onsumption remely useful good practices
☐ Not at		☐ Not usef				remely useful
Comparative asses			ving perform	ance with the	respective perfor	mance of your
peers (e.g. colleag	•	•	_	_	_	
☐ Not at		☐ Not usef				remely useful
Historical compari	•			•		
☐ Not at	all useful	☐ Not usef	ul 🗌 Neut	ral 🗌 Use	eful 🗌 Extr	remely useful
Tips or suggestion		gy saving pra				
☐ Not at	all useful	☐ Not usef	ul 🗌 Neut	ral 🗌 Use	eful 🗌 Extr	remely useful
Progress, tips and similar to me	lessons learr	ned on specif	ic energy sav	ving actions pe	rformed by other	r users that are
Sillilai to lile ☐ Not at	allusaful	☐ Not usef	ul 🗆 Neut	ral 🔲 Use	oful 🗆 Ev+	remely useful
Advice and quote						•
energy agencies, e		sy experts (ii	including ext	erriar eriergy c	onsultants, energ	gy researchers,
□ Not at	=	☐ Not usef	ul 🗆 Neut	ral 🗆 Use	oful □ Ev+	remely useful
						•
Links to data abou □ Not at		Not usef				remely useful
□ Not at	ali uselui	□ Not user	ui 🗀 Neut	.rai 🗀 USE	iui 🗀 Exti	emery userui
- 4.4 In case you wa be the desired fre		•	s/cues to ad	opt energy sav	ing behaviour: w	hat would
	Strongly	Desirable	Neutral	Undesirable	Strongly	Not
	desirable				undesirable	applicable
2-3 daily						
daily						





-	4.5 When is the right time for you to receive these messages/cues?	In which order you would
	prioritize the following? (1 for first choice, 2 for second choice, etc.)	
	☐ When I enter the building	
	☐ When I switch on my computer	
	☐ When I return from the lunch break	
	☐ When I'm about to leave the office	
	☐ Every time an inefficient energy behaviour was detected	
	☐ Please specify:	

- 4.6 How would you respond to signs at your workplace / building regarding best practices for energy saving? (e.g. the sign presented below¹)



	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
They will help me to					
change my energy-					
related behaviour					

¹ http://www.recyclereminders.com/conserve-energy-signs