

TAKING  
**COOPERATION**  
FORWARD



International Workshop about Consumer Behaviour, Consumption Practices and Rebound Effect, Maribor, 10.4.2018



**People use energy, not buildings: novel approach to influence users' behaviour**



Jure Vetršek, Institute for Innovation and development of University of Ljubljana

# Institute for Innovation & Development of University of Ljubljana

- IRI UL is a joint venture between the UL and 10 technologically most advanced and successful Slovenian companies.
- It is a non-profit institute in public interest with a mission to transfer, distribute / intensify the application of knowledge, produced at the UL.

University of Ljubljana

Industry, government, community



Research and  
development  
competences



Research and  
development  
needs



Spin-offs

Life Long Learning

Consulting

Innovation

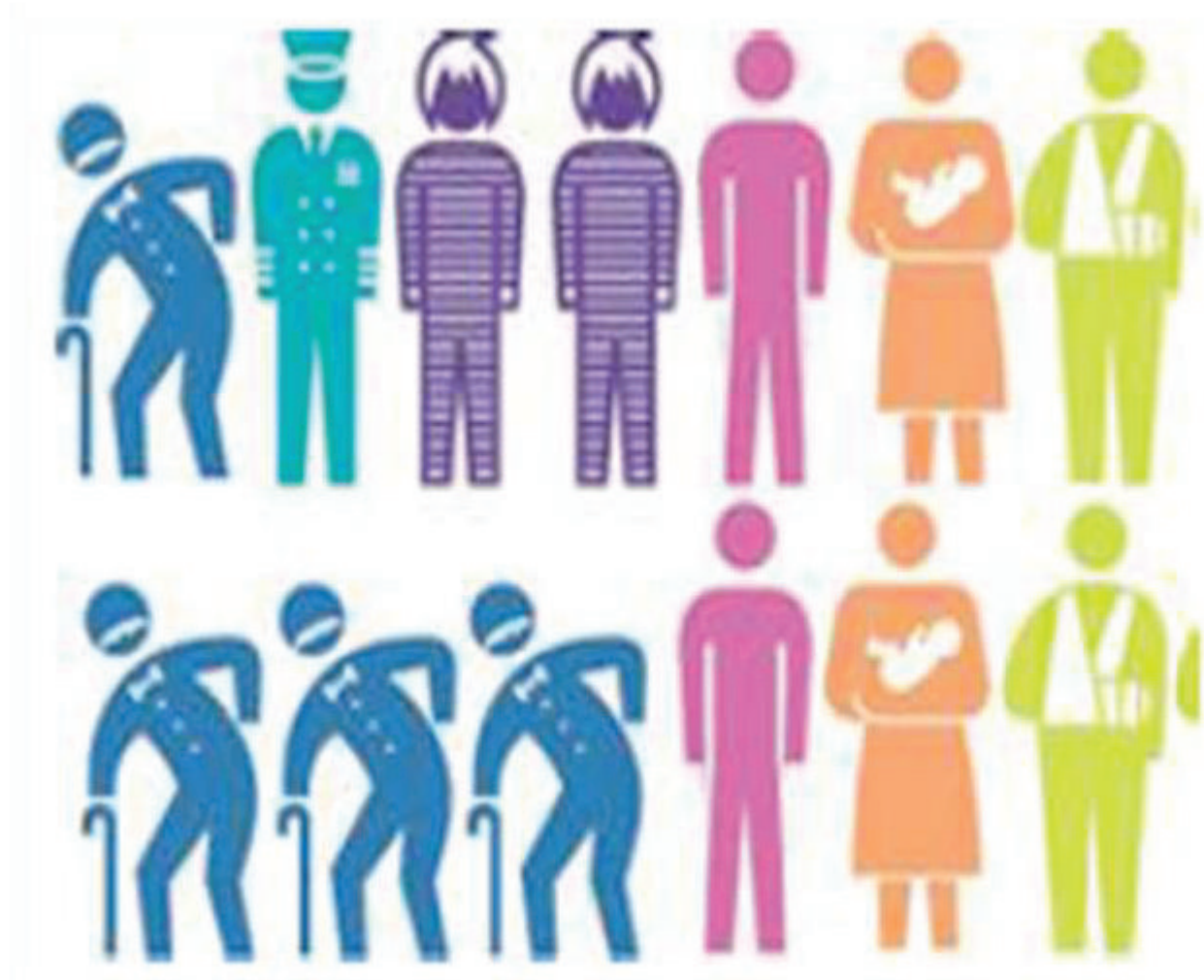
New knowledge



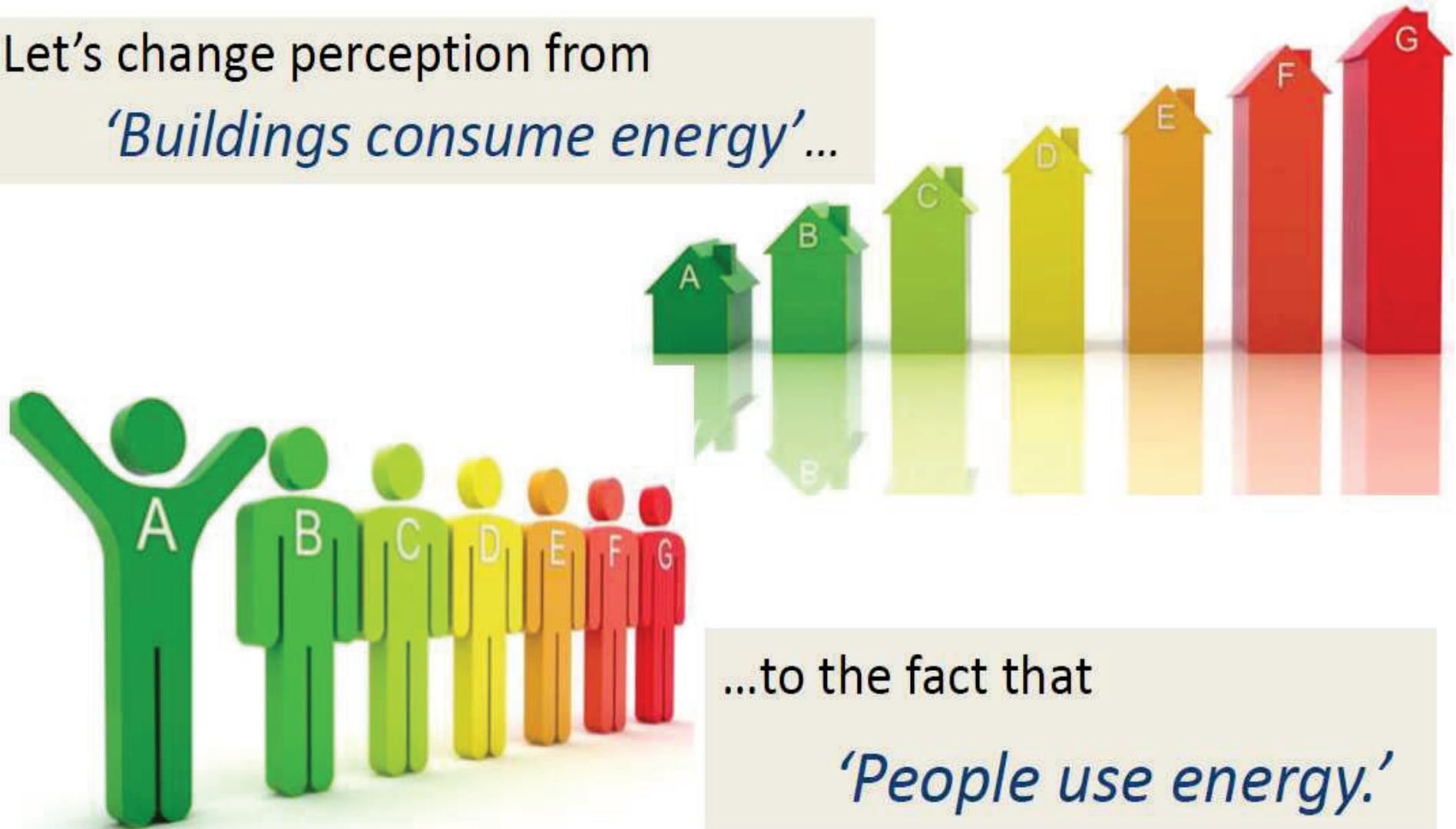
# Can we survive Anthropocene?



# WHY DO WE NEED BUILDINGS?



Let's change perception from  
*'Buildings consume energy'...*



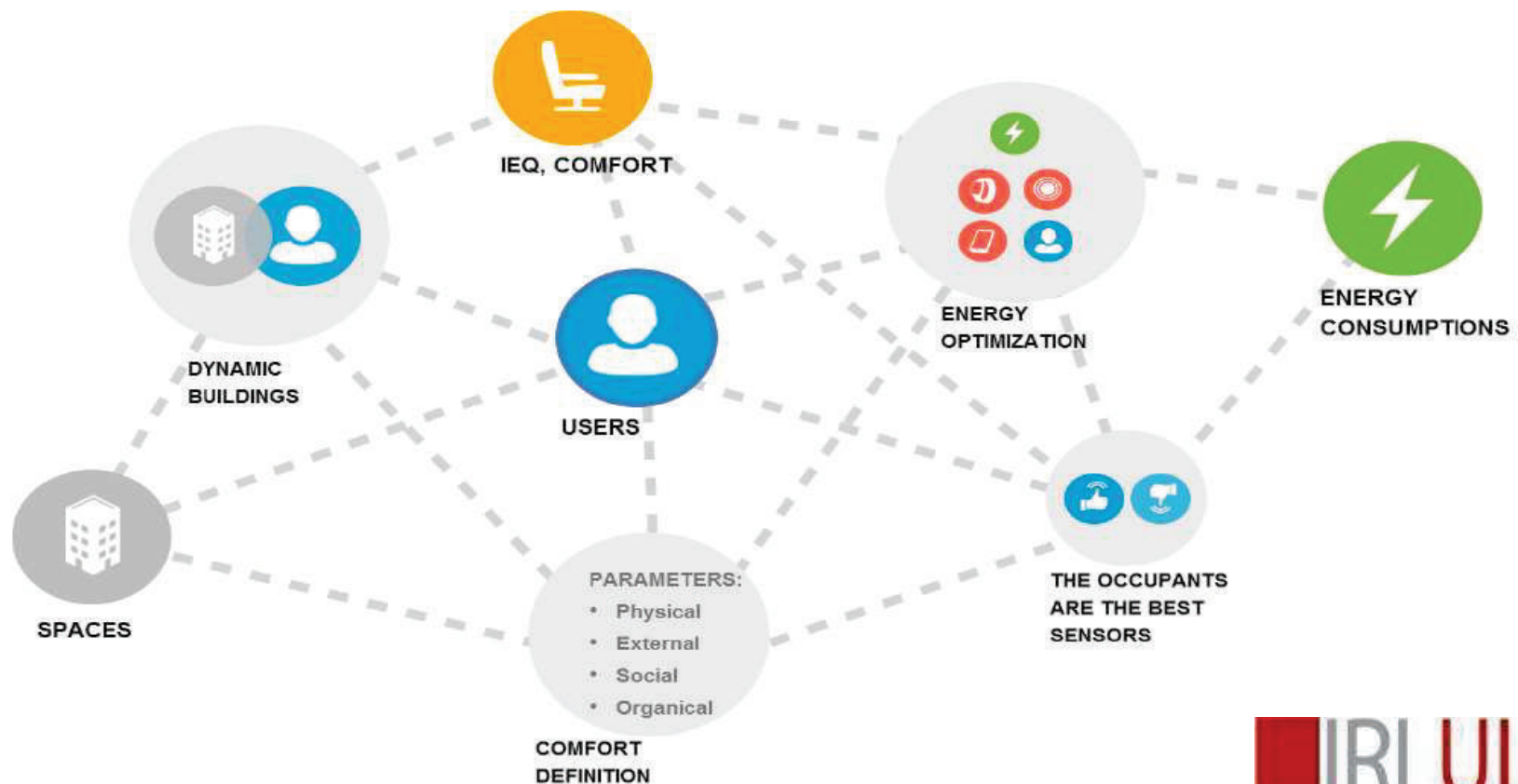
...to the fact that

*'People use energy.'*



# THE BUILDING ECOSYSTEM

.....is efficient if all the components are mutually conscious.....

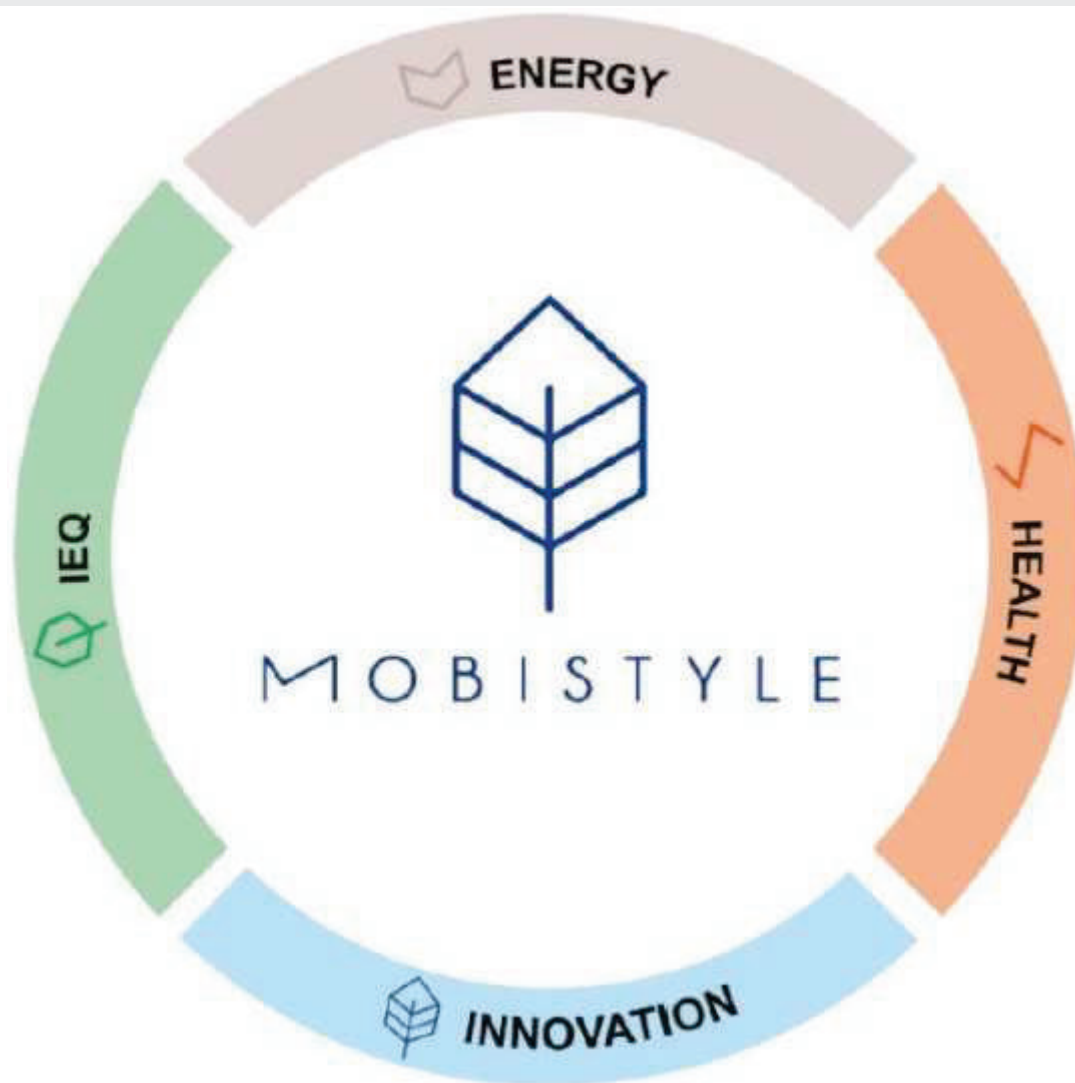


MOBISTYLE





# THE APPROACH

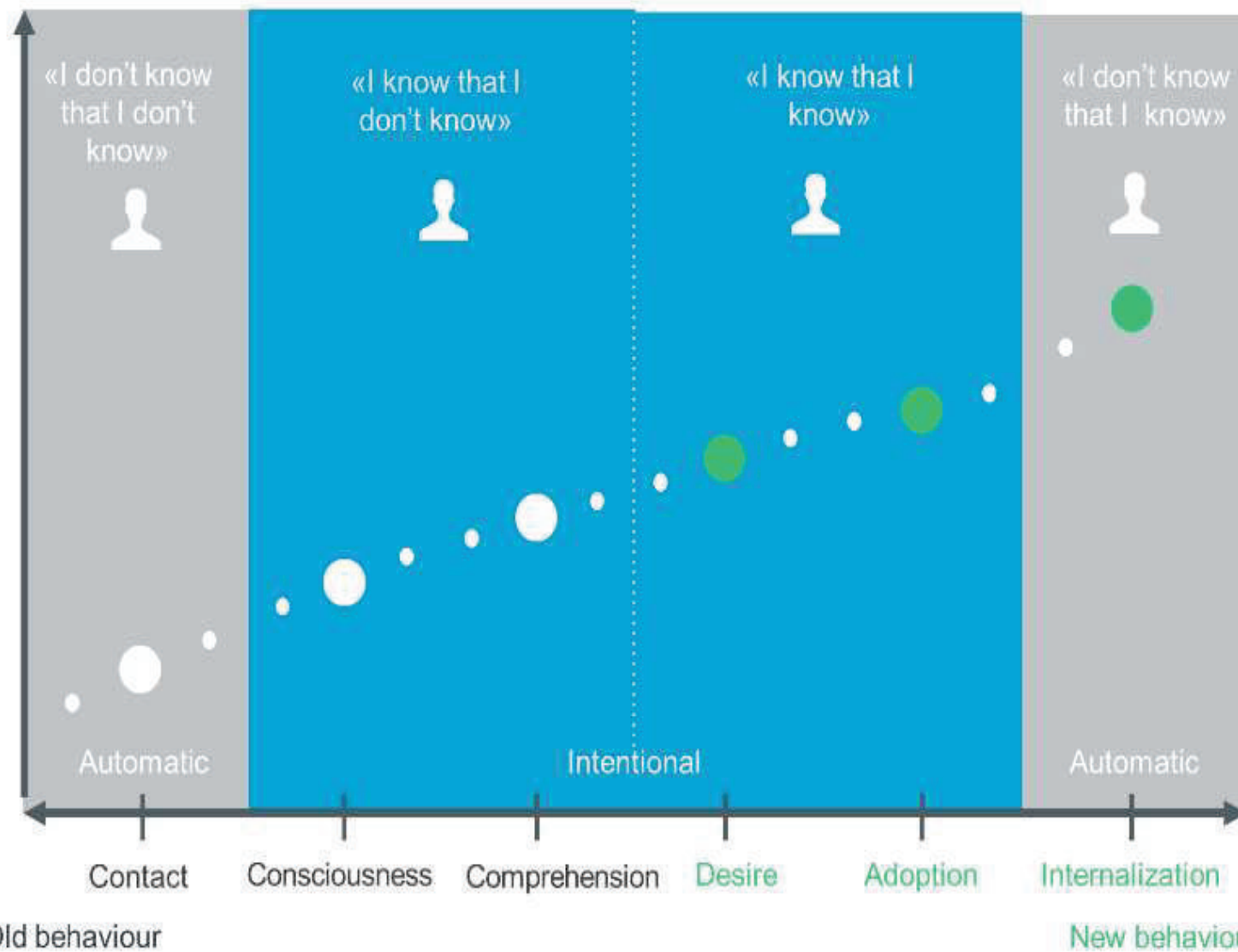


TAKING COOPERATION FORWARD

# BEHAVIOUR CHANGE

Change

"The change is gradually.."





# MEASURE VS MANAGE

Qualitative + quantitative approach

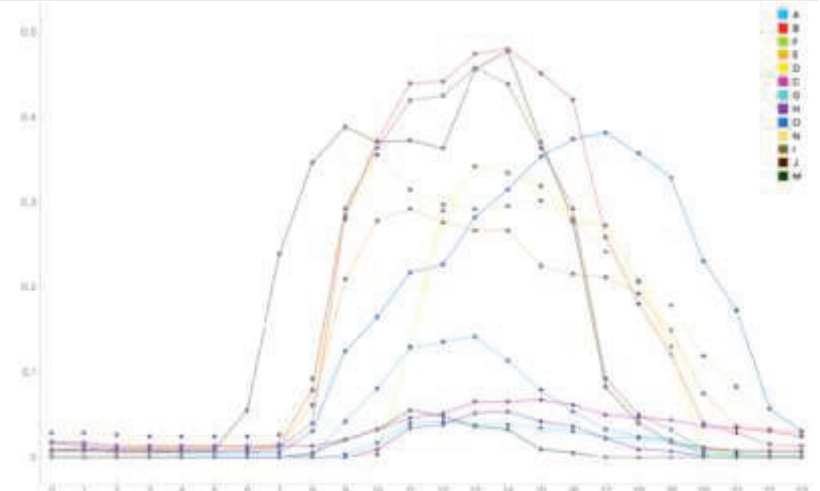
Which and how the data should be collected?

What does the data tell us?

Possible interactions i.e. thermostat adjustments, window opening...

User groups

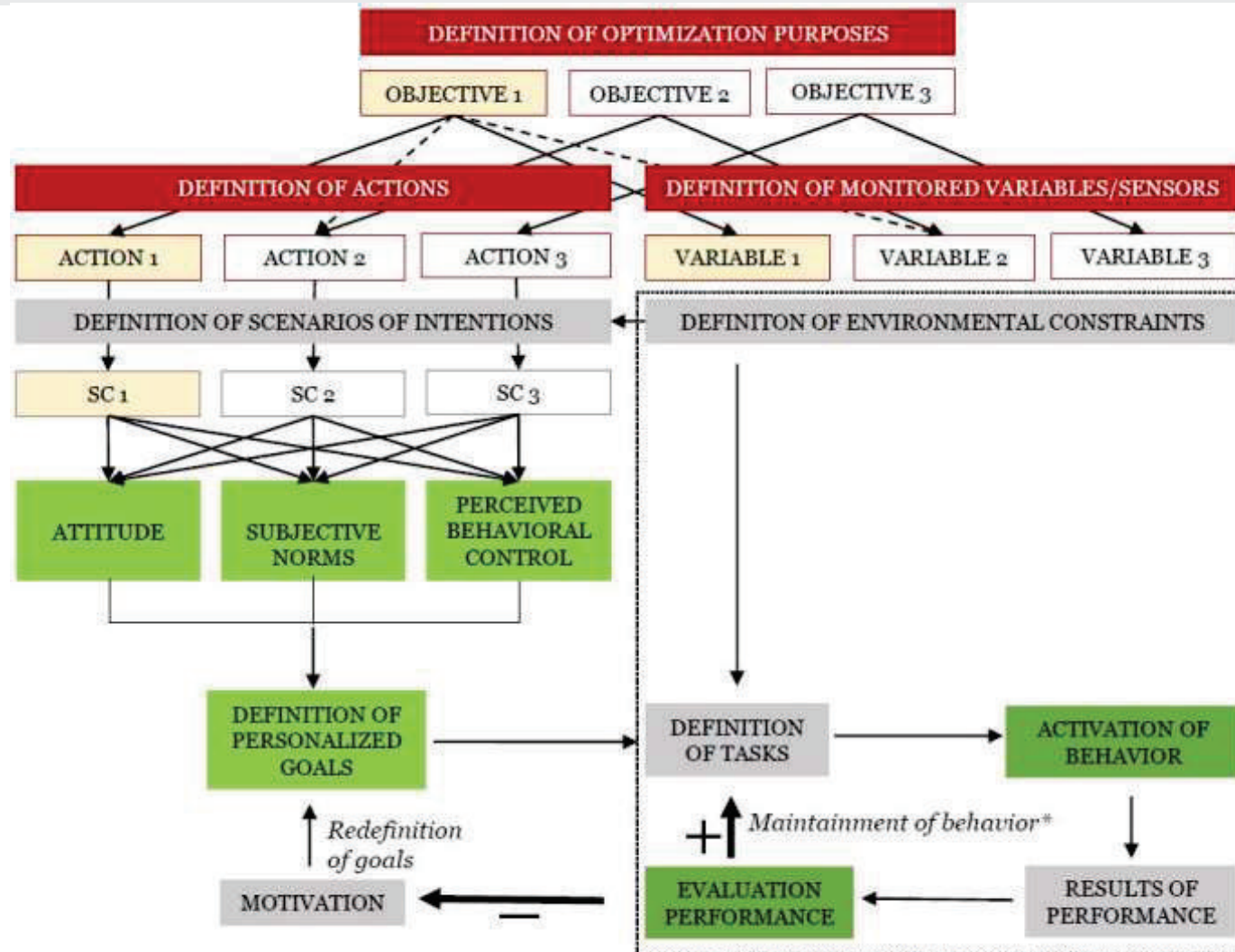
Channels



**Interreg**  
CENTRAL EUROPE

European Union  
European Regional  
Development Fund

**TOGETHER**



# DATA

## EduFootprint calculator



### RESULTS BY AREA: School's Environmental Footprint

#### TOTAL

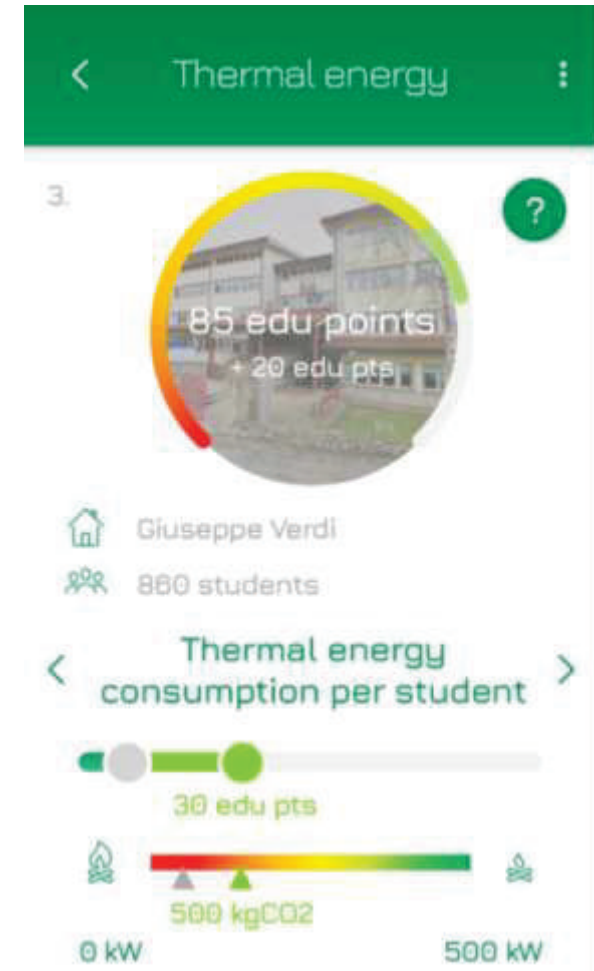
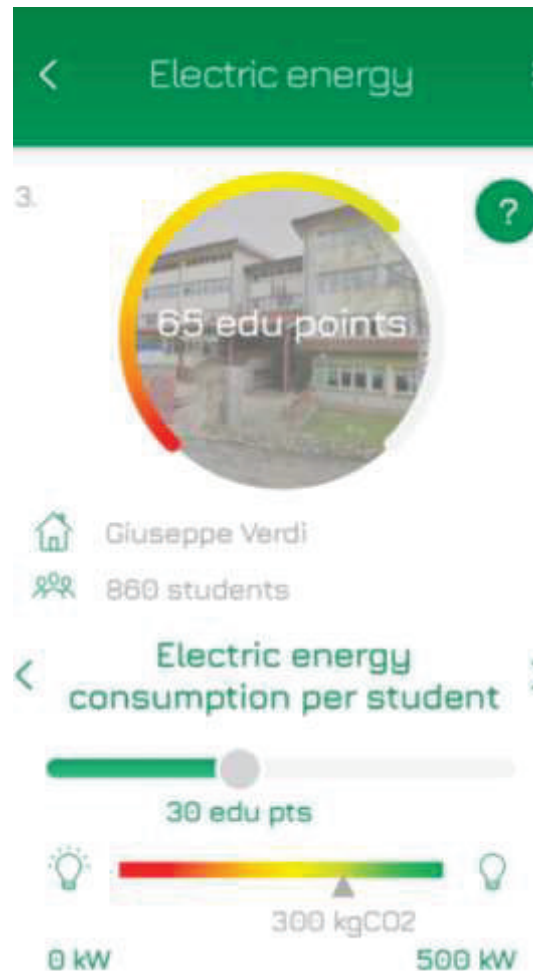
Impact category (part of resource)	Total primary energy MJ	Climate change kg CO <sub>2</sub> eq.	Ozone depletion kg CFC-11 eq.	Freshwater availability CTUe	Human toxicity, cancer effects CTUh	Human toxicity, non-cancer effects CTUh	Particulate matter kg PM2.5 eq.	Ionizing radiation kg U235 eq.	Photochemical ozone formation kg NMVOC eq.	Acidification mole H <sup>+</sup> eq.	Terrestrial eutrophication kg N eq.	Freshwater eutrophication kg P eq.	Marine eutrophication kg N eq.	Water resource depletion m <sup>3</sup> water eq.	Mineral, fossil & non resource depletion kg Sb eq.	Land use kg C deficit
<b>TOTAL</b>	<b>7.073.951,81</b>	<b>4.017.500,86</b>	<b>5,90</b>	<b>146.301.048,77</b>	<b>0,31</b>	<b>4,18</b>	<b>2.949,04</b>	<b>414.572,69</b>	<b>17.313,30</b>	<b>31.659,25</b>	<b>82.479,70</b>	<b>3.383,91</b>	<b>8.395,03</b>	<b>-668,66</b>	<b>019,10</b>	<b>2.699.153,75</b>
<b>BUILDING CONSUMPTION</b>		<b>829.932,41</b>	<b>0,03</b>	<b>7.846.479,53</b>	<b>0,08</b>	<b>0,29</b>	<b>926,22</b>	<b>149.650,80</b>	<b>2.497,09</b>	<b>14.303,09</b>	<b>7.122,23</b>	<b>1.301,52</b>	<b>931,08</b>	<b>1.625,21</b>	<b>1,45</b>	<b>486.584,45</b>
ELECTRIC ENERGY		394.448,41	0,03	3.618.489,47	0,04	0,13	321,70	140.875,37	1.099,93	6.104,79	3.187,14	594,20	413,71	571,85	1,11	106.264,70
THERMAL ENERGY		833.799,13	0,00	4.218.645,83	0,04	0,16	603,86	2.140,11	1.393,81	8.189,29	3.923,26	706,12	496,04	114,08	0,67	339.167,00
WATER CONSUMPTION		1.684,87	0,00	8.544,23	0,00	0,00	0,98	635,31	3,34	9,00	11,82	1,21	1,32	839,17	0,67	1.152,76
<b>PRODUCT CONSUMPTION</b>		<b>1.110.915,02</b>	<b>5,65</b>	<b>79.479.609,07</b>	<b>0,20</b>	<b>3,86</b>	<b>1.025,80</b>	<b>79.026,53</b>	<b>3.525,91</b>	<b>8.220,85</b>	<b>13.339,00</b>	<b>1.071,34</b>	<b>2.752,86</b>	<b>84,90</b>	<b>016,49</b>	<b>1.641.465,78</b>
PAPEL PRODUCTS		20.751,58	0,00	90.155,43	0,00	0,01	10,52	2.990,34	44,86	104,13	163,24	8,74	20,72	27,53	1,04	66.433,59
STATIONERY PRODUCTS		10.294,03	0,00	75.839,88	0,00	0,00	9,87	1.068,19	26,58	58,24	89,64	4,10	9,32	-19,57	0,15	5.490,58
TOILET AND CLEANING PRODUCTS		61.555,77	0,01	885.949,48	0,00	0,02	31,13	4.985,55	148,44	274,80	623,25	14,26	100,30	1.765,27	2,13	132.823,70
EQUIPMENT		1.018.313,63	5,64	78.427.864,29	0,19	3,02	968,27	70.582,47	3.306,03	7.783,68	12.462,87	1.944,23	2.622,52	-1.688,34	013,13	1.436.717,90
CHEMICAL LABS		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
GARDENING		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
<b>MOBILITY</b>		<b>1.629.289,79</b>	<b>0,21</b>	<b>2.820.197,37</b>	<b>0,03</b>	<b>0,12</b>	<b>1.207,04</b>	<b>163.271,02</b>	<b>11.545,04</b>	<b>11.816,91</b>	<b>42.834,56</b>	<b>352,50</b>	<b>1.979,58</b>	<b>-1.526,07</b>	<b>1,07</b>	<b>738.087,07</b>
INTERNAL VEHICLES		117,76	0,00	84,20	0,00	0,00	0,08	7,34	0,30	0,34	0,93	0,00	0,08	0,03	0,00	1,81
HOME SCHOOL		1.617.195,12	0,21	2.818.457,10	0,03	0,12	1.205,37	161.059,85	11.511,38	11.796,08	42.707,09	352,43	1.968,00	-1.526,49	1,07	731.001,00
TRAVEL EXCURSIONS		2.926,92	0,00	1.645,67	0,00	0,00	1,69	203,22	33,37	26,48	125,94	0,04	11,50	6,39	0,06	2.083,26
FOOD		24.401,89	0,00	0,00	0,00	0,00	0,00	0,00	25,94	139,82	25,73	0,00	0,00	0,00	0,00	0,00
CANTEEN		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
CATERING		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
COFFENDING MACHINES		24.401,89	0,00	0,00	0,00	0,00	0,00	0,00	25,94	139,82	25,73	0,00	0,00	0,00	0,00	0,00



# KNOWING AND DOING

Mobile APP - Information about the project, CO<sub>2</sub> footprint of demo schools; Knowledge & measures & actions about CO<sub>2</sub> footprint;

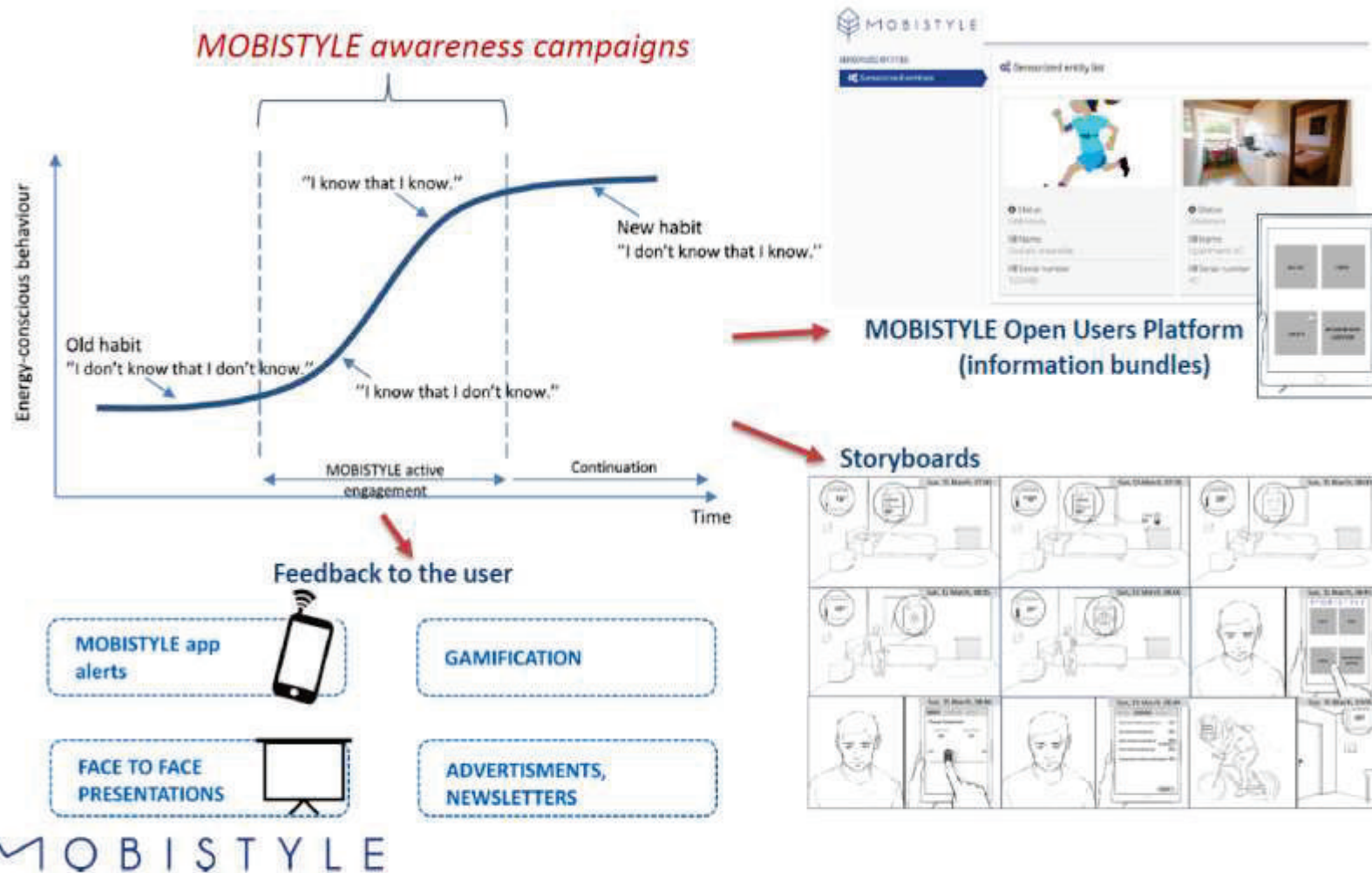
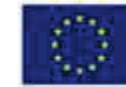
Interactive tool for students& teachers



# INFLUENCING BEHAVIOUR



Change occurs gradually



# TO CONCLUDE

People use energy, not buildings

IEQ is and driving factor for influencing users (health, productivity and well being )

To know and communicate state of IEQ, sensors and supporting ICT infrastructure is needed

Continuous multi channel campaign is necessary







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## THANK YOU FOR YOUR ATTENTION!

**International Workshop about Consumer  
Behaviour, Consumption Practices and  
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