

Interreg
Mediterranean



EduFootprint

School Low Carbon Footprint in Mediterranean cities

**“Energy & profession guidance”
Intervention of Energy Efficiency,
Research, and Training**



Provincia di Treviso – Italy, 23rd of November 2018

University of Ljubljana



Founded in 1919 (oldest and largest in Slovenia)

- Public
- 23 faculties & 3 academies
- 3.900 researchers
- 49.000 students
- 305 research groups, laboratories & institutes



CWUR: 370 world rank (<http://cwur.org/2018-19.php>)

Institute for Innovation & Development of University of Ljubljana

- IRI UL is a joint venture between the UL and 9 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



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Spin-offs

Life Long Learning

Consulting

Innovation

New knowledge

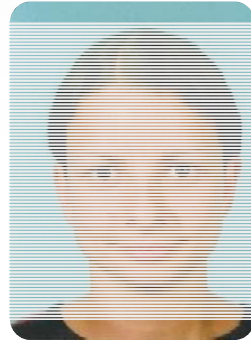
The team

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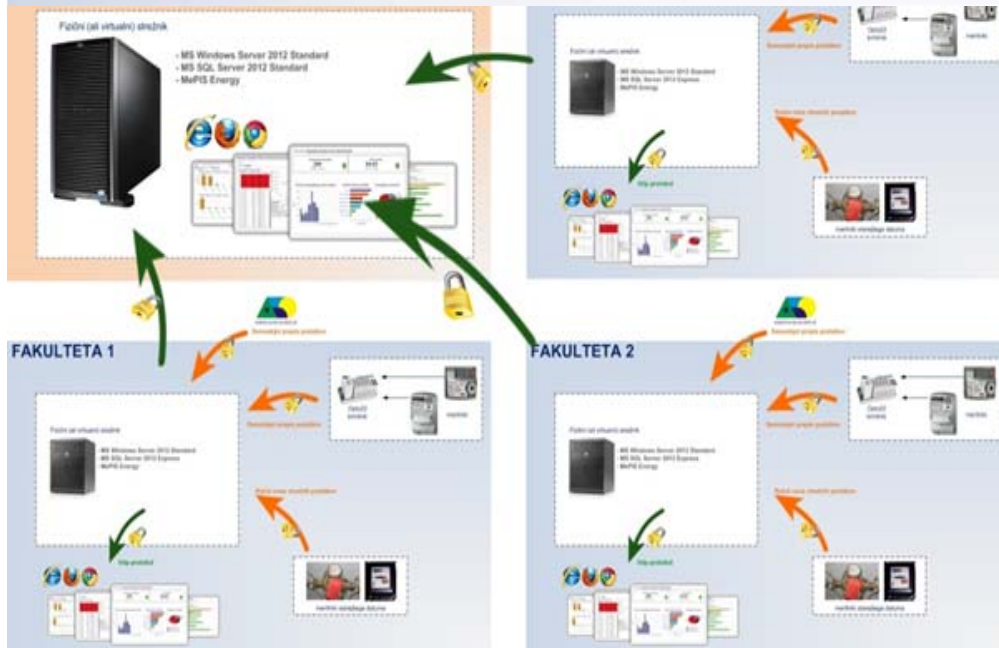
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IRI UL - Energy management for UL buildings



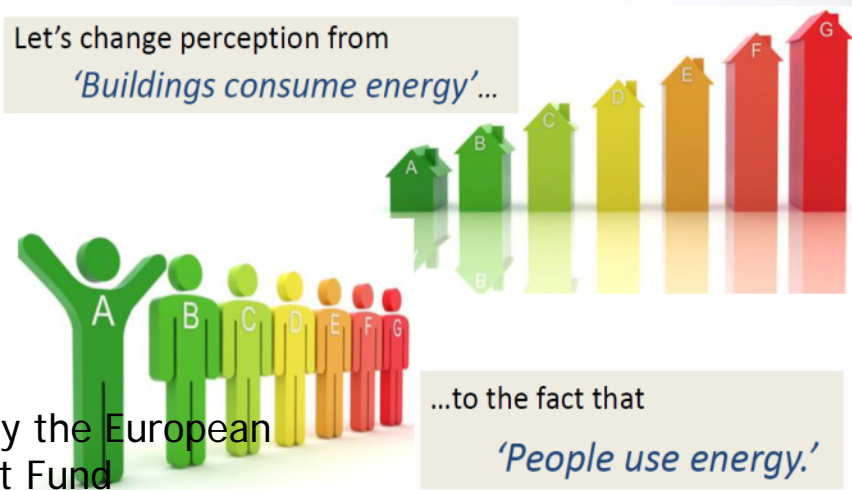
Energy information system and service to the UL towards retrofit of buildings

Motivation of end users towards changing the habits in using energy



TRaining Personnel towards operational Energy Efficiency of the buildings

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



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Can we survive Anthropocene?

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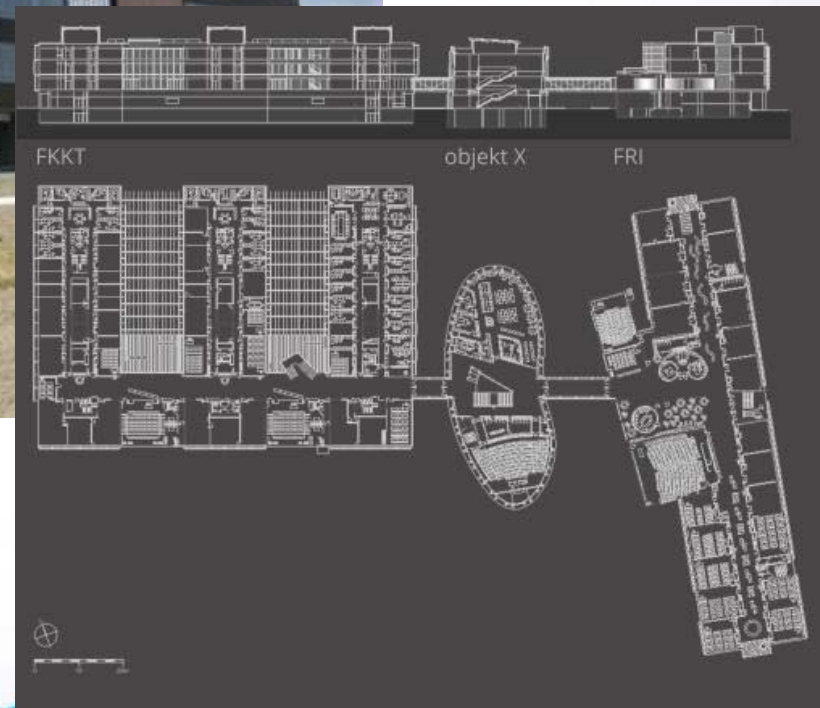
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Faculty of Chemistry and Chemical Technology - FKKT



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FKKT building LCA

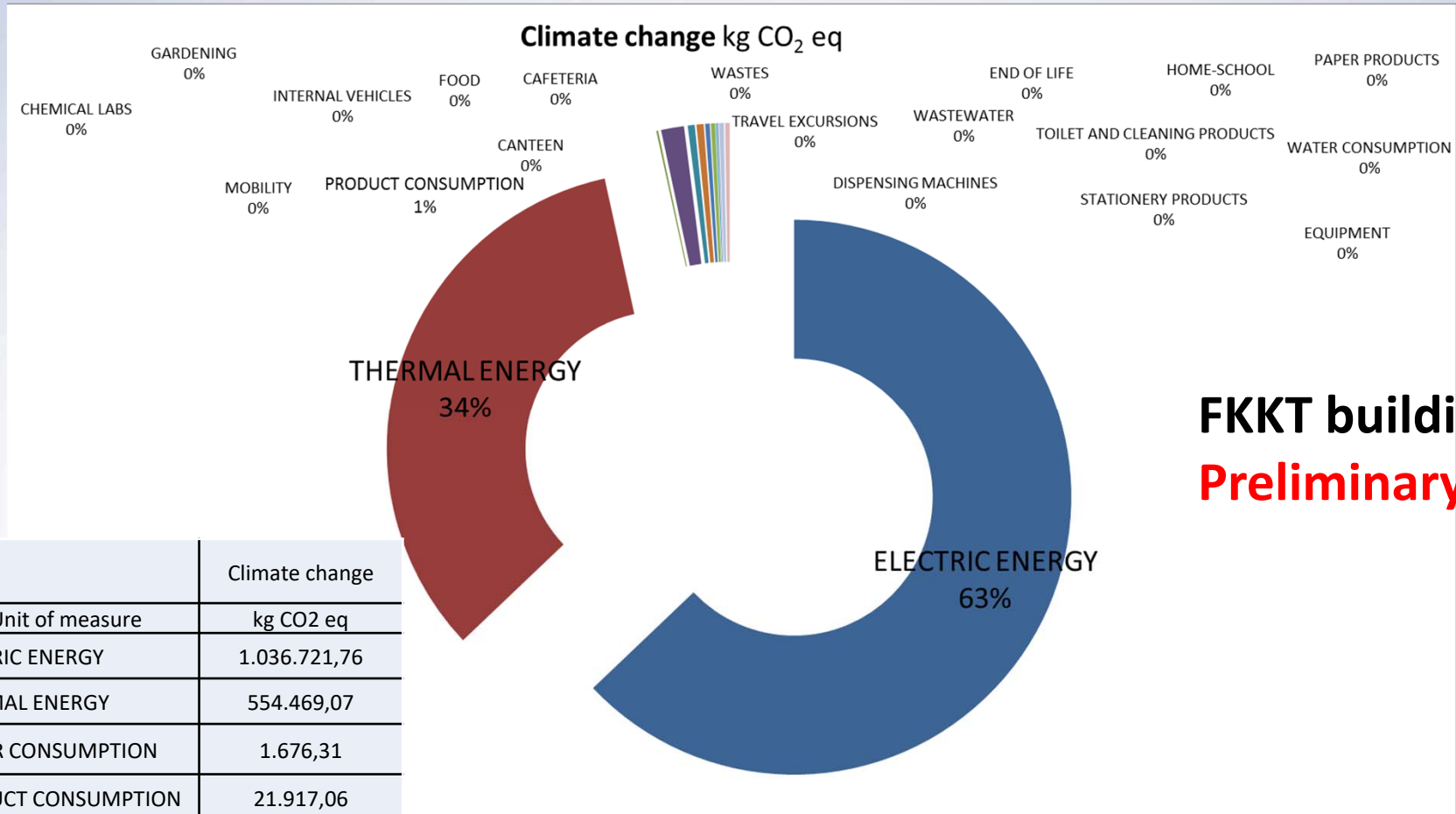


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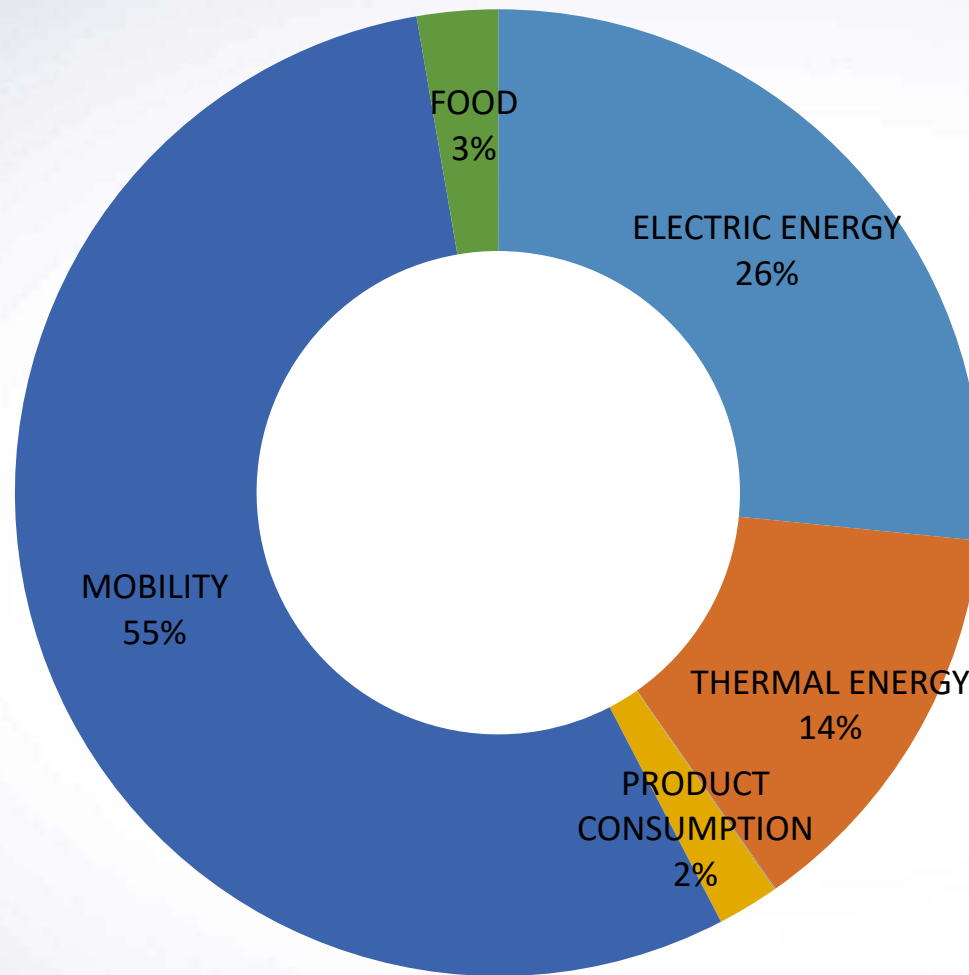
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FKKT building LCA Preliminary data

	Climate change
Unit of measure	kg CO ₂ eq
ELECTRIC ENERGY	1.036.721,76
THERMAL ENERGY	554.469,07
WATER CONSUMPTION	1.676,31
PRODUCT CONSUMPTION	21.917,06
PAPER PRODUCTS	6.658,41
STATIONERY PRODUCTS	6.852,64
TOILET AND CLEANING PRODUCTS	4.318,53

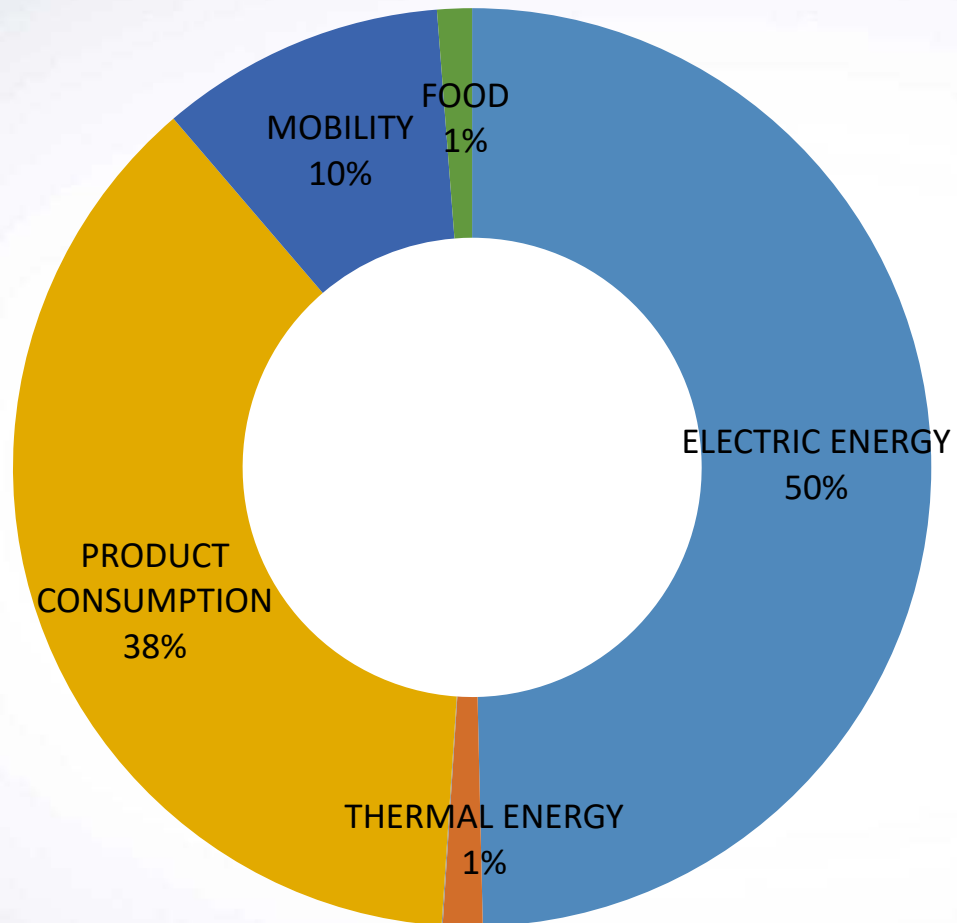
Climate change in kg CO₂ eq



FKKT building LCA



Freshwater ecotoxicity in CTUe



FKKT building LCA

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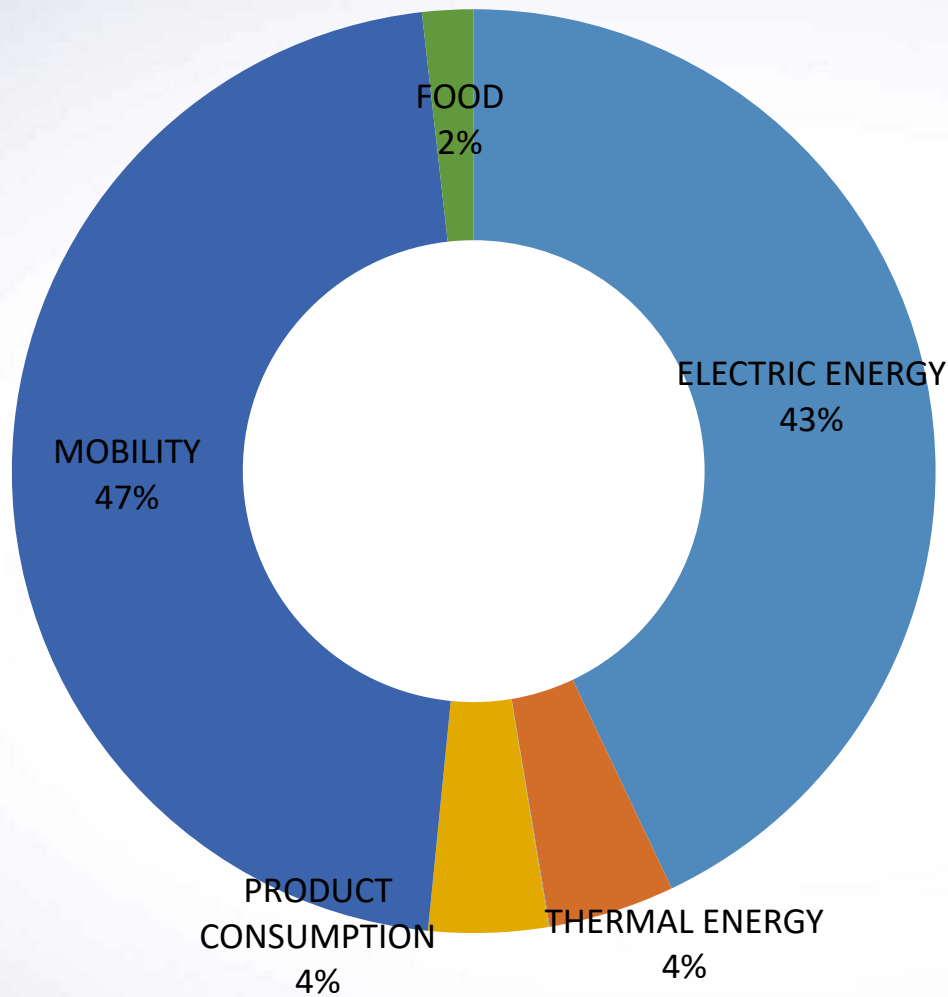


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Particulate matter in kg PM_{2.5} eq



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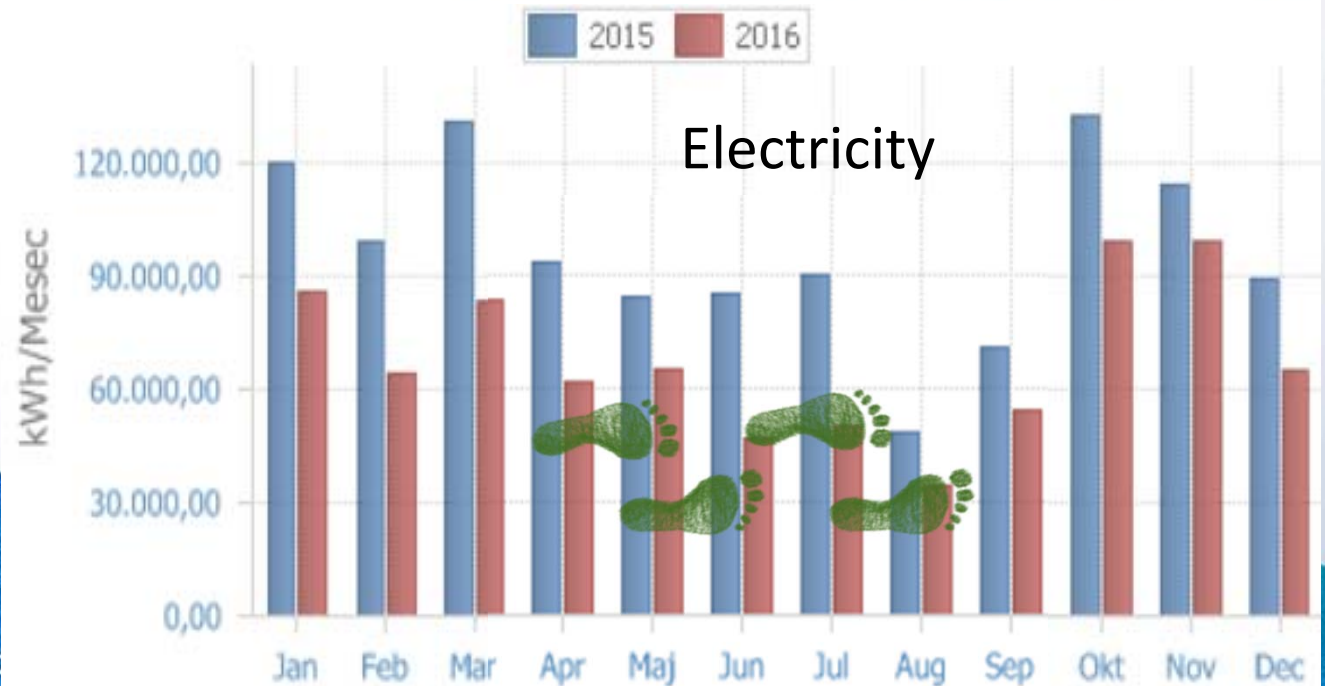
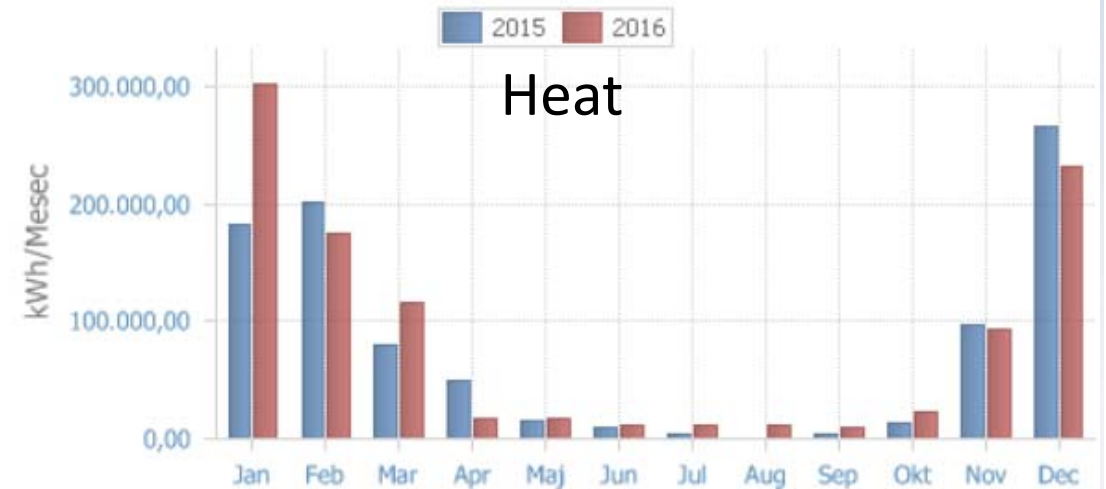
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After energy management implemented (EF)

✓ Start of active energy management in 2016



The data

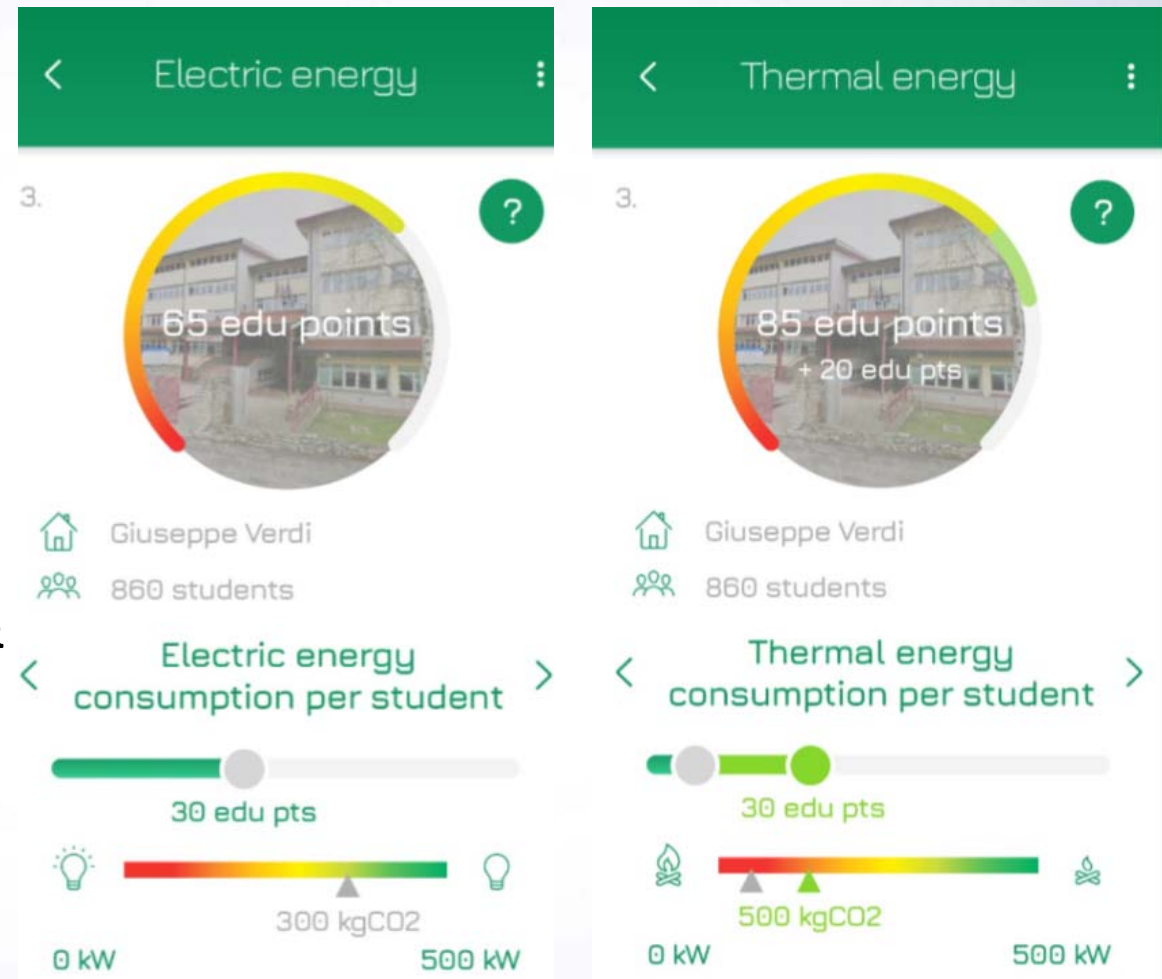
EduFootprint calculator																
EduFootprint																
RESULTS BY AREA: School's Environmental Footprint																
TOTAL																
Impact categories Unit of measure	Total primary energy MJ	Climate change kg CO2 eq	Ozone depletion kg CFC 11 eq	Freshwater ecotoxicity CTUc	Human toxicity, cancer effects CTUh	Human toxicity, non-cancer effects CTUh	Particulate matter kg PM2.5 eq	Ionizing radiation kSv U235 eq	Photochemical ozone formation kg NMVOC eq	Acidification molc H+ eq	Terrestrial eutrophication molc N eq	Freshwater eutrophication kg P eq	Marine eutrophication kg N eq	Water resource depletion m3 water eq	Mineral, fossil & ren resource depletion kg Sb eq	Land use kg C deficit
TOTAL	7,478,951.81	4,017,500.86	5.90	146,301,048.77	0.31	4.18	2,949.04	414,572.69	17,313.30	31,659.25	62,479.74	3,383.91	8,395.03	-668.66	619.10	2,699,153.75
BUILDING CONSUMPTION		829,932.41	0.03	7,846,679.53	0.08	0.29	926.22	169,650.80	2,497.09	14,303.09	7,122.22	1,301.52	911.08	1,625.21	1.45	446,584.45
ELECTRIC ENERGY		394,448.41	0.03	3,618,489.47	0.04	0.13	321.70	166,875.37	1,099.93	6,104.79	3,187.14	594.20	413.71	571.95	1.31	106,264.70
THERMAL ENERGY		433,799.13	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	496.06	114.09	0.07	339,167.00
WATER CONSUMPTION		1,684.87	0.00	9,544.23	0.00	0.00	0.66	635.31	3.34	9.00	11.82	1.21	1.32	939.17	0.07	1,152.76
PRODUCT CONSUMPTION		1,110,915.02	5.65	79,479,809.07	0.20	3.06	1,025.80	79,626.55	3,525.91	8,220.85	13,339.00	1,071.34	2,752.86	84.90	616.49	1,641,465.78
PAPER PRODUCTS		20,751.59	0.00	90,155.43	0.00	0.01	16.52	2,990.34	44.86	104.13	163.24	8.74	20.72	27.55	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	5,490.59
TOILET AND CLEANING PRODUCTS		61,555.77	0.01	885,949.49	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	78,427,864.28	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	613.18	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
MOBILITY		1,620,233.79	0.21	2,820,197.37	0.03	0.12	1,207.04	163,271.02	11,545.04	11,816.91	42,834.56	352.50	3,979.58	-1,526.07	1.07	733,087.07
INTERNAL VEHICLES		117.76	0.00	94.20	0.00	0.00	0.08	7.94	0.30	0.34	0.93	0.00	0.08	0.03	0.00	1.81
HOME SCHOOL		1,617,195.12	0.21	2,818,457.50	0.03	0.12	1,205.27	163,059.85	11,511.38	11,790.08	42,707.69	352.43	3,968.00	-1,526.49	1.07	731,002.00
TRAVEL EXCURSIONS		2,920.92	0.00	1,645.67	0.00	0.00	1.69	203.22	33.37	26.49	125.94	0.06	11.50	0.39	0.00	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
CAFETERIA		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
DISPENSING 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
END OF LIFE		589,447.40	0.00	57,685,347.72	0.02	0.76	9.13	2,800.99	225.15	150.55	582.01	14.81	931.52	-811.30	0.11	1,103.24
WASTES		587,189.46	0.00	57,650,983.52	0.02	0.75	8.17	2,502.34	219.16	126.39	513.51	8.84	813.21	20.82	0.10	801.83
WASTEWATER		2,257.94	0.00	34,364.20	0.00	0.02	0.95	298.65	5.99	24.16	68.50	5.97	118.31	-832.11	0.01	301.40

Knowing and doing

Mobile APP - Information about the project, CO₂ footprint of demo schools;

Knowledge & measures & actions about CO₂ footprint;

Interactive tool for students & teachers



Mobile APP – download



GET IT ON
Google Play



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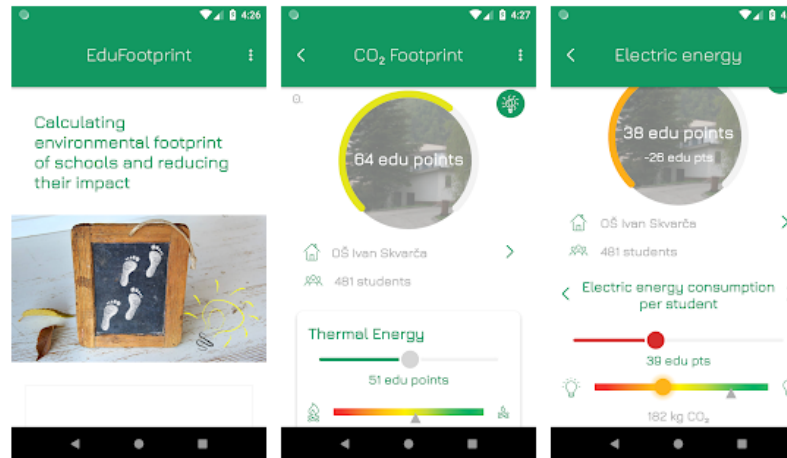
Specto.si Izobraževanje

★★★★★ 3

3 PEGI 3

Ta aplikacija je združljiva z vašo napravo.

Nameščno



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Rethinking Energy Efficiency in Buildings

“Buildings in EU use nearly 40% of final energy...” .

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



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

MOBISTYLE



This project has received funding from the European Union's H2020 framework programme for research and innovation under grant agreement No 723032



...to the fact that

'People use energy.'

Mediterranean



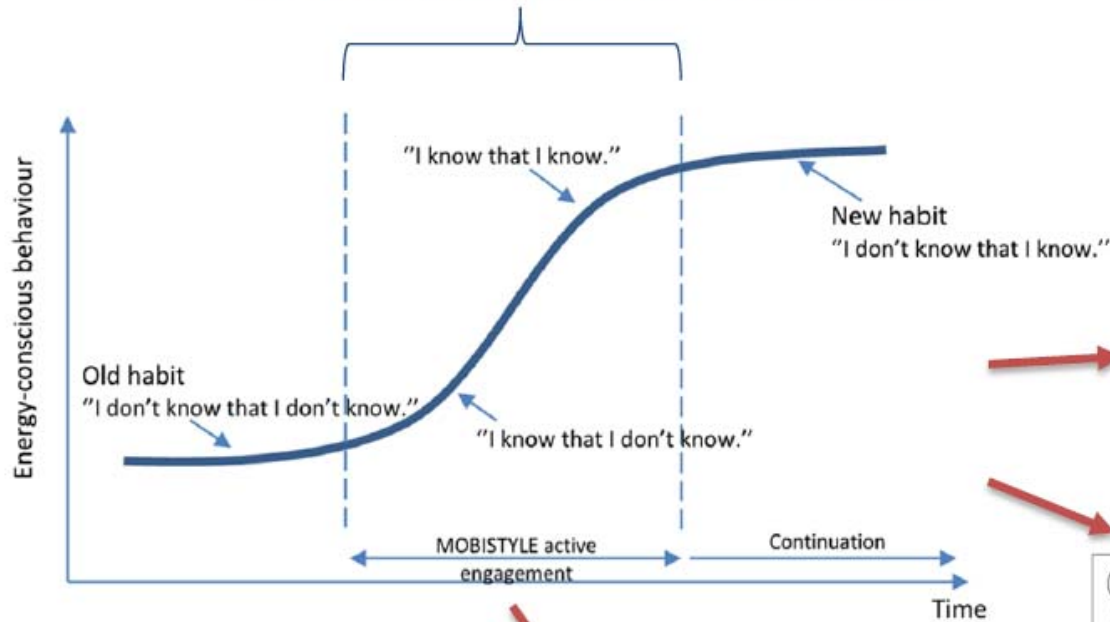
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Change occurs gradually



MOBISTYLE awareness campaigns



The interface shows a 'Sensorized entity list' with two items. The first item is a person running, with details: Status: Unknown, Name: Giulia's wearable, Serial number: 123456. The second item is an interior room, with details: Status: Unknown, Name: Apartment 4C, Serial number: 4C. To the right is a tablet displaying a grid of four icons labeled 'WIFI', 'HEAT', 'WATER', and 'MOBISTYLE (BYRON)'. Below the interface is the text 'MOBISTYLE Open Users Platform (information bundles)'.

Storyboards

The storyboard shows several app screens. One screen displays 'Missions' with a list of tasks: 'Improve your health and save energy!', 'Choose and track your monthly objectives', 'Try to learn to improve your lifestyle', and 'Check and track your milestones'. Another screen shows 'ISSUES' with a green checkmark and the text 'No issues detected'. A third screen shows a person's face. At the bottom are navigation icons for 'House Status', 'Missions', and a user profile. The MOBISTYLE logo is at the top right of the screens.

Feedback to the user

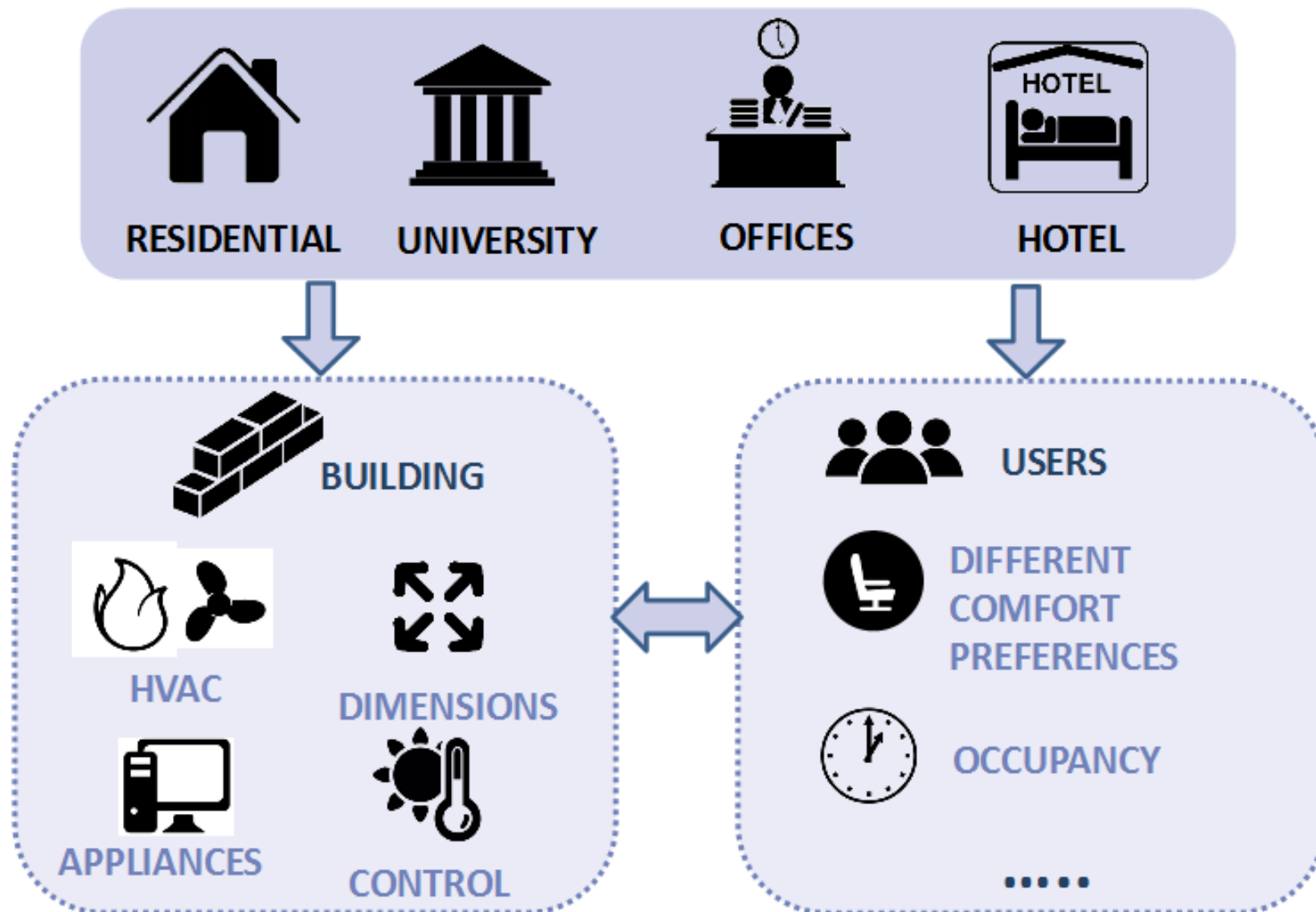
Four dashed-line boxes represent feedback methods: 'MOBISTYLE app alerts' (with a smartphone icon), 'GAMIFICATION', 'FACE TO FACE PRESENTATIONS' (with a presentation screen icon), and 'ADVERTISEMENTS, NEWSLETTERS'.



MOBISTYLE

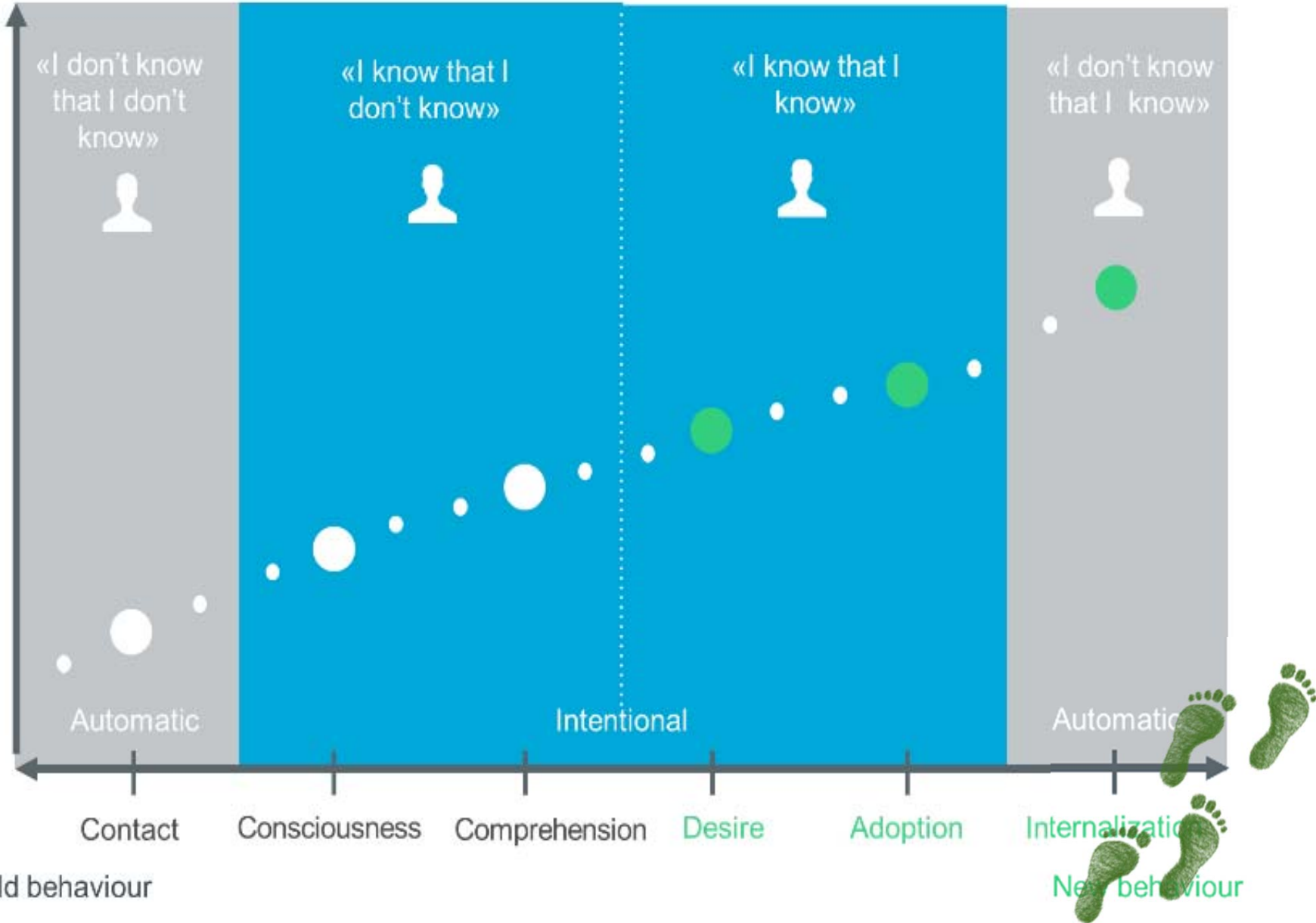


Testbeds



Change

“The change is gradually..”



Outro

- ✓ To reduce footprint in SI buildings, we focus on modifying user behavior towards energy efficiency
- ✓ IEQ is and driving factor for influencing users (health, productivity and well being are drivers)
- ✓ To know and communicate state of IEQ, sensors and supporting ICT infrastructure is needed
- ✓ Continuous multi channel campaign is necessary





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Development of
University of Ljubljana



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Thank you for
your attention!

Transnational workshop
Treviso – Italy, 23rd of November 2018

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