A Roadmap for Sustainable Actions

A Better Tomorrow Begins Today

The Danish Student House

Welcome

Since 1932, the Danish Student House in Paris (DDS) has been a safe and affordable base for students and researchers choosing to live and learn in Paris.

Over the years, countless young people have chosen to live at the house, drawn by the unique combination of Danish hygge **and the cosmopolitan diversity of Paris.**

As DDS approaches its centennial year, an opportunity to reflect on the previous century of excellence within the Cité Internationale Universitaire de Paris (CIUP) community, its gaze also turns towards the future, and the 100 years to come.

Moving forward, DDS aims to become a catalyst for sustainable action, inspiring both the young people who call it home and the broader CIUP community with innovative and creative carbon (CO_2) emission reduction and resource conservation strategies.

The Danish Student House in Paris

Content

Rite de Passage

The journey towards sustainability begins with the ethnographic fieldwork conducted at DDS. Among the insights from the research is the fact that students are eager for more responsibility – they want to be active in the development and care of a sustainable community.

This community-mindedness comes with a great opportunity: to transform this student “rite de passage” from a residential experience to complete shift in lifestyle. DDS becomes a literal living lab, teaching residents sustainable life lessons within the context of a supportive community – lessons that can be applied in their lives in Paris and beyond.

One of the greatest challenges in establishing and maintaining sustainable behaviours is that we – as citizens, students, residents – are rarely informed of the environmental impacts of our behaviors.

Without feedback, it becomes nearly impossible to measure, track, assess, and improve our habits. Instead, we operate in the dark, largely unaware of the impact of our actions relative to carbon emissions or the United Nations' Sustainable Development Goal (SDG) framework.

The proposed sustainability framework for DDS was sparked by the refurbishment of the kitchen and common areas. The renovation was an opportunity to not just refresh an outdated space, but to showcase the potential for social wellbeing through healthy, sustainable materials.

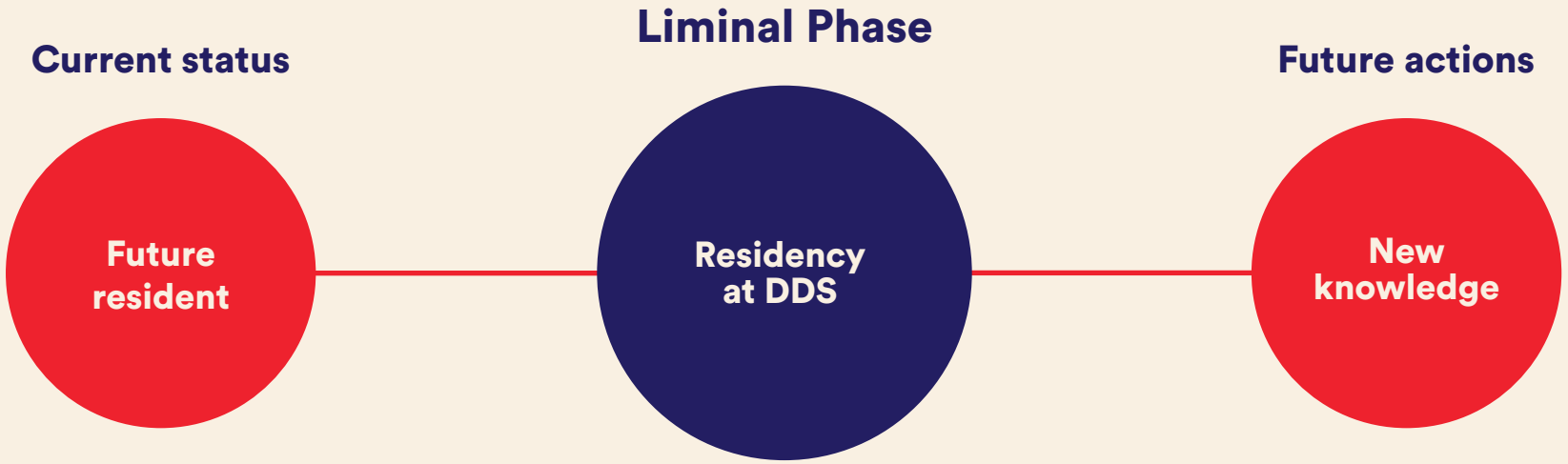
It marked a turning point for the house, one in which students were, sometimes for the first time, encouraged to reflect on the impact of their behavioral and ecological choices within the context of their home.

In a new DDS house, residents will be active participants in sustainable living and learning. By providing the tools to understand and improve their own behaviors, they are empowered to exercise these lessons throughout their lives in Paris and beyond.

Taking these lessons beyond the "classroom" is perhaps the most exciting potential. As students return home – or cross the world to find new ones – their 'sustainability toolkit' will make them ambassadors for DDS and the planet Earth alike.

The following roadmap was developed in close collaboration with DDS staff and students. Staff and students will have the latitude to shape and engage with, respectively, the outlined actions to become pioneers for a new paradigm of sustainable education.

Rite de Passage



- **Write** a paragraph about sustainable living as part of the DDS application
- **Reflect** upon one's carbon footprint prior to life at DDS
- **Generate** ideas for novel sustainability actions at DDS
- **Prepare** for a sustainable lifestyle in Paris

- **Acquire** a fundamental understanding of the guiding sustainability principles at DDS
- **Participate** and **organize** specific actions and events at DDS
- **Engage** with the DDS Sustainability Committee
- **Increase** one's overall sustainability awareness
- **Immerse** oneself in the holistic sustainability culture

- **Familiarize** oneself with new sustainable actions
- **Embody** the mindset of an ambassador
- **Share** lessons learned at DDS with others
- **Take** action

Supporting a Global Framework

DDS has selected ten SDGs that are key drivers for the strategy

“ [The] risk is simply not acceptable to us – we who have to live with the consequences.”

Greta Thunberg, UN Climate Action Summit 2019

Generational relevance

Though not of their creation, the burden of human-induced climate change will be borne by the current generation and generations to come.

The shift in perspective required to confront the challenge of climate change is no small task, but has already germinated and developed within today's youth; with the task recognized and the appropriate mindset established, today's generation is ready to rise to the challenge.

Though the world turns slowly, other global actors are beginning to awaken to the impending crisis.

As calls for action grow - led often by the world's youth - governmental bodies, commercial entities, and non-governmental organisations the world over have started to act, slowly implementing a more circular form of thinking.

71%

of 18-29 year olds Danes say climate change is a "serious threat".

(Concito, 2018)

Young adults are coming of age during a turbulent time, one in which the world finds itself at a critical juncture.

This juncture is marked by a divergence between the deeply entrenched theories and systems that underpin the current world-order, and the willingness of those involved to take responsibility for change - a change that is both necessary and urgent.

70%

of 18-29 year olds believe behavior & lifestyle change is necessary to solve climage change, compared to 54% of Danes of all ages.

Targets for the future

Through the publishing of Intergovernmental Panel on Climate Change (IPCC) reports, the acceptance of the Paris Climate Accord, and similar international agreements, global actors are working to move towards a more sustainable world.

The City of Paris recognizes this trend, and through the creation and implementation of the Paris Climate Action Plan, outlined its vision for the future. While it is valuable to compare the performance of DDS to the current state of the built environment in France, and to compare the behaviors of residents to those of their Danish and French compatriots, it is more appropriate to respond to the targets and objectives for 2050.

2025 Roadmap

DDS embarked on the journey towards holistic behavioral and technical sustainability through the refurbishment of the kitchen and common areas.

Through the process, the building and program management team engaged with the SDG's, using this framework as a guiding light regarding all manner of decision-making.

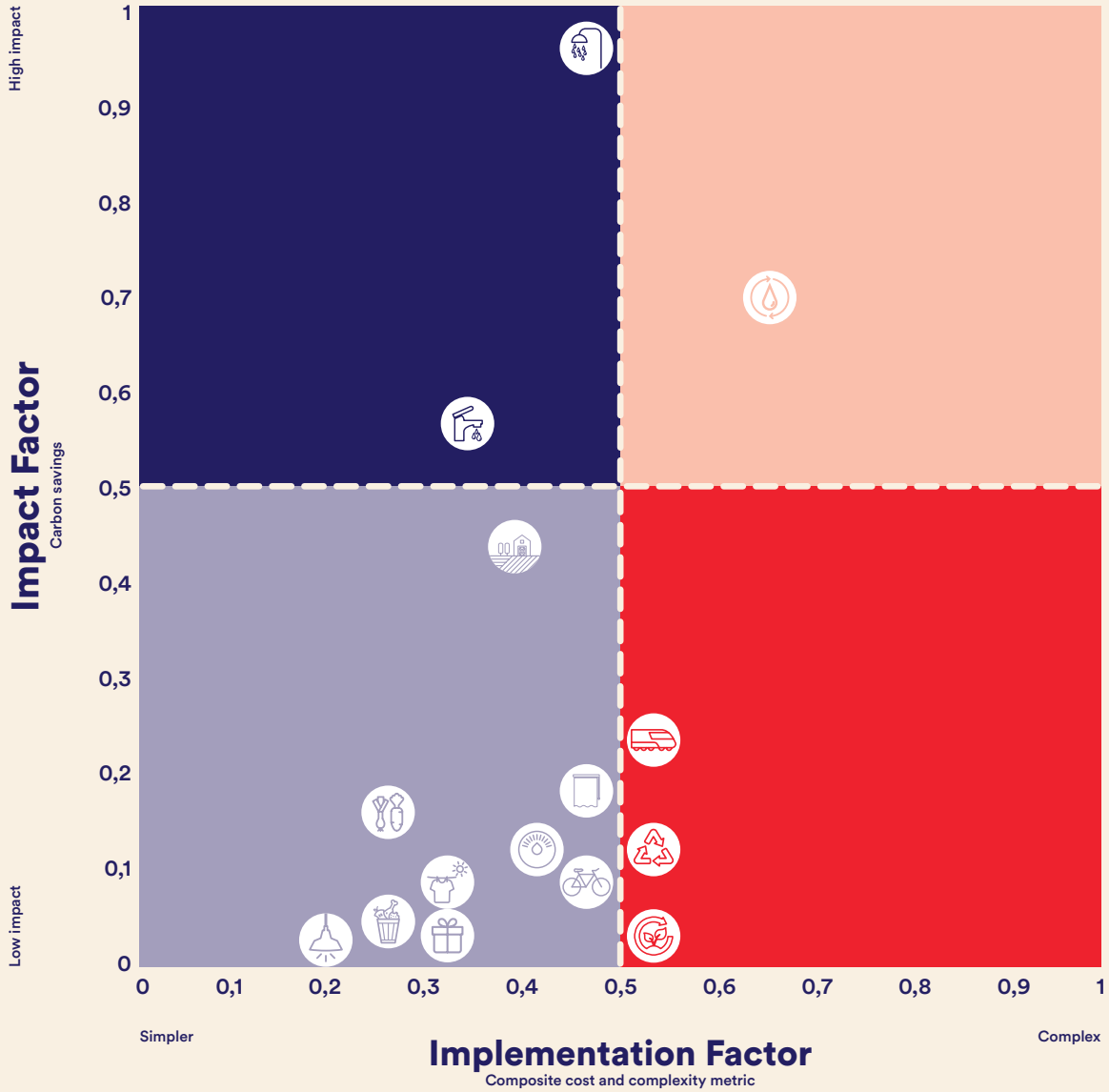
Through continued dialog, the recommendations outlined in this report are based upon the integration of staff and student perspectives, which responded to the physical and social environment at DDS.

The critical summation of these interactions occurs in three points:

- Embrace technical upgrades to help facility performance align with the SDG's and City of Paris targets
- Implement student behavioral changes to reduce individual and community carbon footprints
- Facilitate student-driven "sustainability" campaigns that drive the DDS sustainability action portfolio from one academic term to the next

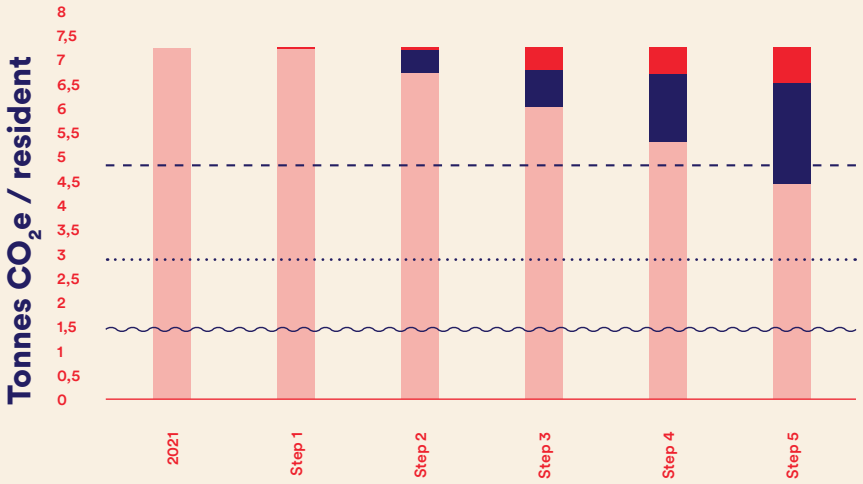
CO_2e Savings per Action per Resident

Impact versus Implementation

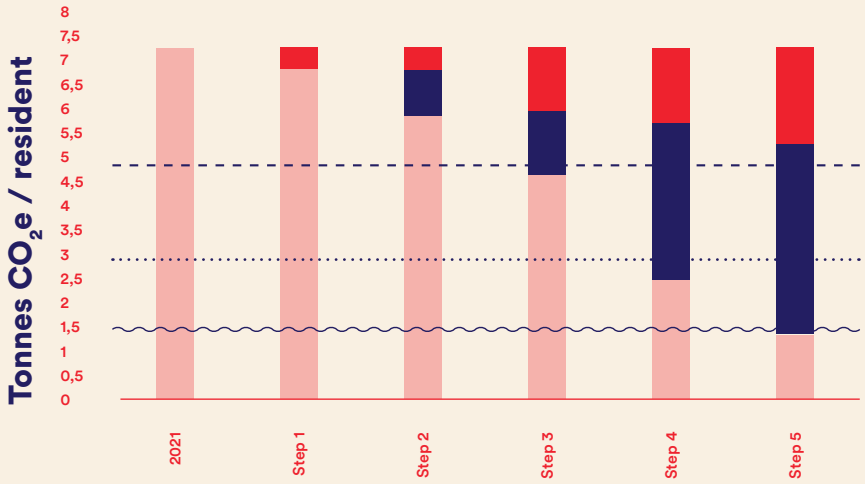


5 Step Upgrade Implementation

CO_2e Emissions Per Resident (Min. performance values)



CO_2e Emissions Per Resident (Max. performance values)



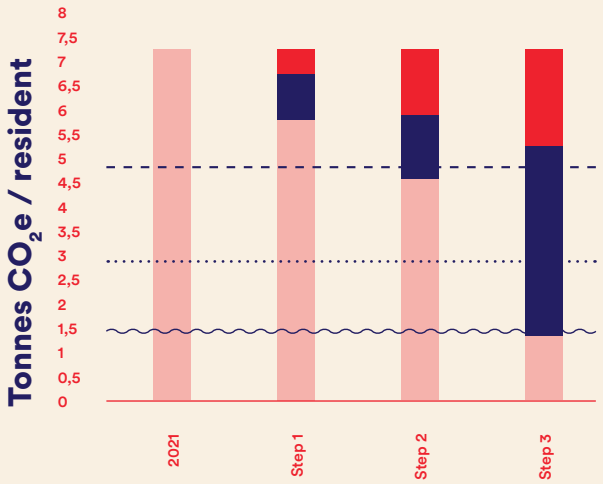
Reduce emissions by 2,8 to 5,9 tonnes CO_2e across 5 steps

- Emissions Avoided via Behavioral Interventions
- Emissions Avoided via Techinal Interventions
- Emissions for Phase
- Paris Accord: Per Capita Emissions Limit for 2.0° Warming Target
- Paris Accord: Per Capita Emissions Limit for 1.5° Warming Target
- Absolute Sustainability World Bank Limit

Aggressive Implementation

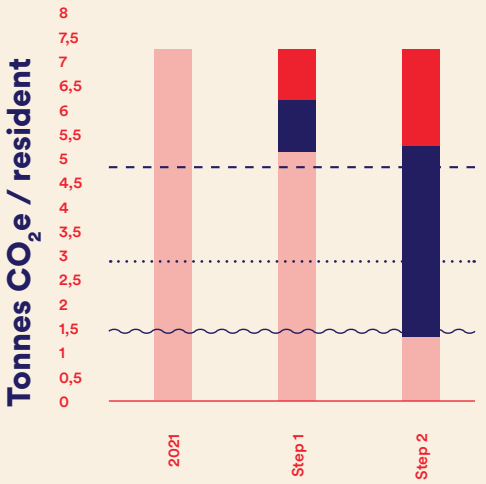
3 Step Implementation

CO_2e Emissions Per Resident (Max. performance values)



2 Step Implementation

CO_2e Emissions Per Resident (Max. performance values)



Emissions Avoided via Behavioral Interventions

Emissions Avoided via Techinal Interventions

Emissions for Phase

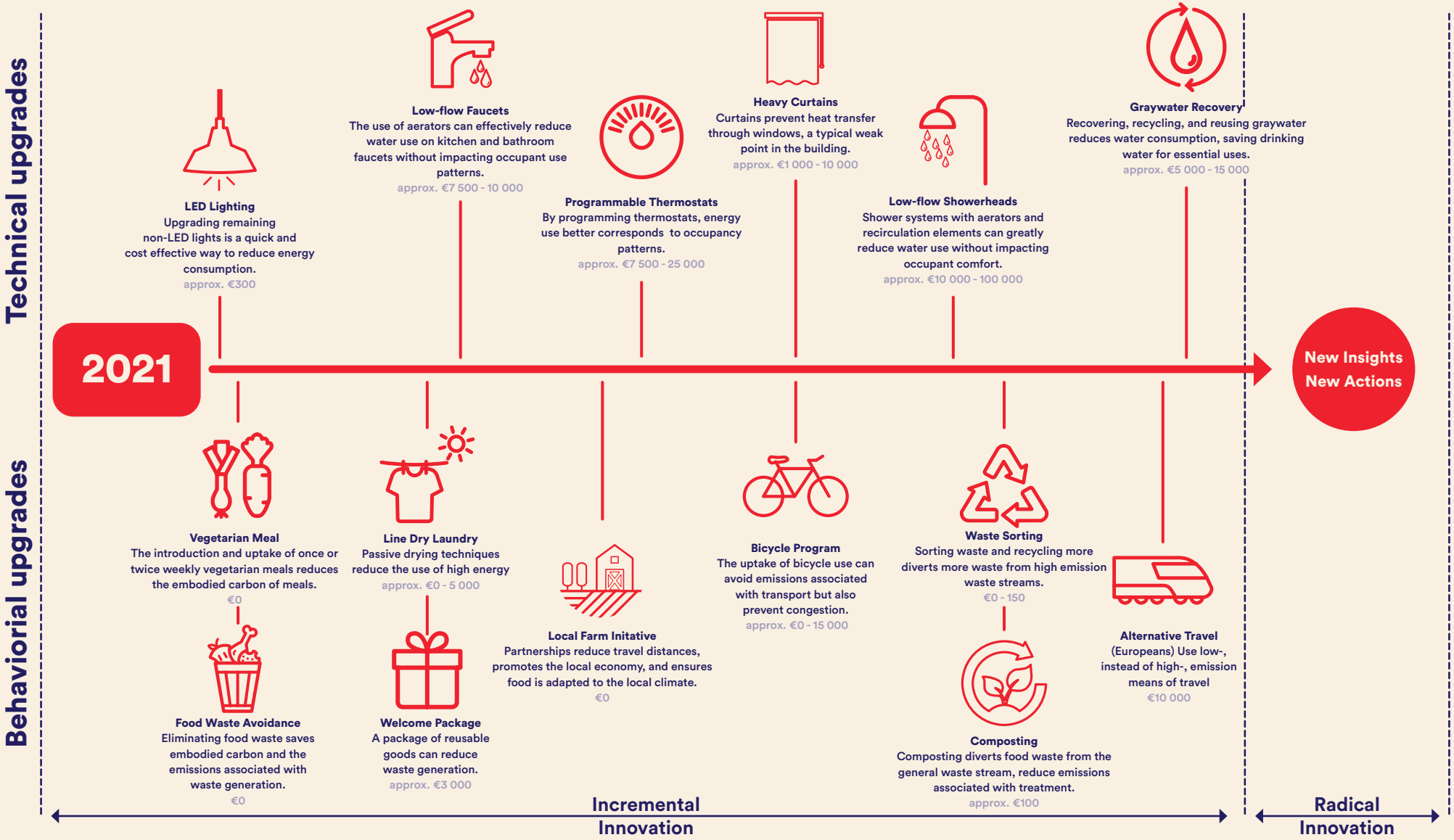
Paris Accord: Per Capita Emissions Limit for 2.0° Warming Target

Paris Accord: Per Capita Emissions Limit for 1.5° Warming Target

Absolute Sustainability World Bank Limit

*Values shown in the aggressive implementation plans assume that the maximum performance values for each upgrade are achieved.

Roadmap


Technical upgrades
Behaviorial upgrades
2021
New Insights
New Actions
LED Lighting
Upgrading remaining non-LED lights is a quick and cost effective way to reduce energy consumption.
approx. €300
Low-flow Faucets
The use of aerators can effectively reduce water use on kitchen and bathroom faucets without impacting occupant use patterns.
approx. €7 500 - 10 000
Programmable Thermostats
By programming thermostats, energy use better corresponds to occupancy patterns.
approx. €7 500 - 25 000
Heavy Curtains
Curtains prevent heat transfer through windows, a typical weak point in the building.
approx. €1 000 - 10 000
Low-flow Showerheads
Shower systems with aerators and recirculation elements can greatly reduce water use without impacting occupant comfort.
approx. €10 000 - 100 000
Graywater Recovery
Recovering, recycling, and reusing graywater reduces water consumption, saving drinking water for essential uses.
approx. €5 000 - 15 000
Vegetarian Meal
The introduction and uptake of once or twice weekly vegetarian meals reduces the embodied carbon of meals.
€0
Line Dry Laundry
Passive drying techniques reduce the use of high energy
approx. €0 - 5 000
Local Farm Initative
Partnerships reduce travel distances, promotes the local economy, and ensures food is adapted to the local climate.
€0
Bicycle Program
The uptake of bicycle use can avoid emissions associated with transport but also prevent congestion.
approx. €0 - 15 000
Waste Sorting
Sorting waste and recycling more diverts more waste from high emission waste streams.
€0 - 150
Alternative Travel
(Europeans) Use low-, instead of high-, emission means of travel
€10 000
Food Waste Avoidance
Eliminating food waste saves embodied carbon and the emissions associated with waste generation.
€0
Welcome Package
A package of reusable goods can reduce waste generation.
approx. €3 000
Composting
Composting diverts food waste from the general waste stream, reduce emissions associated with treatment.
approx. €100
Incremental Innovation
Radical Innovation

Leadership Strategy Enforcement

DDS readily embraces the CO2 reduction goals resulting from evaluation of the IPCC's Assessment Report, with strategic endeavors for the house outline by the Board of Directors and other CIUP stakeholders.

Through review of the following recommendations, DDS leadership can make decisions about the phased implementation of technical upgrades throughout the property.

On the human side, the recruitment and admissions strategy will implement a screening and interview process to assess applicants' correlation with the sustainability implementation framework.

Upon admission, new first year students will enter the newly revised DDS sustainability framework.

After departure, the new sustainability alumni network will disseminate the knowledge gained to a larger audience and will also provide a feedback mechanism for dialog on the success of the program, as well as future upgrades and changes.

Technical Upgrades

LED bulbs

CO2 savings

355

kg carbon per year
7,1 kg CO_2 per resident

Electricity savings

6000

kWh per year
120 kWh per resident

LED bulbs are highly efficient and represent years of lighting technology development.

Not only are they highly efficient, they possess an exceptionally long operating-life, and on the spectrum of cost, they are one of the most cost-effective technical upgrades that can be installed.

*Assumes 103 fluorescent bulbs are upgraded to LEDs
(See the Appendix for further details)

Programmable Thermostats

CO2 savings

4 919 (7 133)

kg carbon per year
98 (143) kg CO_2 per resident

Electricity savings

28 600 (41 470)

kWh per year
572 (829) kWh per resident

A thermostat can reduce energy consumption by providing heating or cooling in response to occupancy patterns, thus avoiding unnecessary mechanical conditioning. After all, does a room need to be heated to an optimal temperature while a student is away in class?

Programmable and smart thermostats represent two levels of upgrade. With the former, the resident enters his planned occupancy schedule into the device; with the latter, sensing technology is used to respond to the resident's presence and learn behavioral patterns.

*Assumes a programmable thermostat reduces energy use by 10%; a smart sensor, 14%. (See the Appendix for further details)

Heavy Curtains

CO2 savings

8 363 (12 298)

kg CO_2 per year
167 (246) kg CO_2e per resident

Natural Gas savings

48 620 (71 500)

kWh of heating energy per year
972 (1 430) kWh per resident

The building envelope, the walls, windows, doors, roof, and their constituent parts, fundamentally control how a building interacts with the external environment. These elements form the building's skin. Among these elements, door and window openings, particularly windows, are one of the building's weak points.

Rather than living in windowless buildings, the energy performance of windows can be improved with the use of heavy curtains, which act to insulate the windows and prevent winter heat loss, which is particularly prevalent at night.

*Assumes residents use the curtains nightly in the winter.
(See the Appendix for further details)
Note: Depending on the thickness of the curtain material and the diligence of residents in closing the curtains before bed, the heat loss can be reduced by up to 25%.

Low-flow Faucets

CO2 savings

23 100 (46 200)

kg CO_2 per year
462 (924) kg CO_2e per resident

Water savings

175 (350)

m^3 per year
3 500 (7 000) liters per resident

The processes involved in the delivery fresh, clean water means that water has a notable carbon footprint, not to mention the equally important need to preserve water, a diminishing global resource.

The water that finds its way to household faucets represents roughly a quarter of all water consumed in a residence. Thus, changing the faucets in kitchens and bathrooms can significantly reduce the water waste.

*Assumes each fixture runs for 8 minutes a day
(See Appendix)

Low-flow Showerheads

CO2 savings

32 604 (95 304)

kg carbon per year
652 (1 906) kg CO_2e per resident

Water savings

247 (722)

m^3 water per year
4 940 (14 440) liters per resident

Changing the showerheads is another easy way to minimize water use. As bathing and showering represents the single largest enduse of water in a residence, addressing shower water use can drastically impact carbonemissions and deliver water savings.

New technologies reduce the volume of water discharged from the showerhead without altering the sensation experienced by the bather, with the latest technologies actively filtering and recycling water to deliver even higher levels of efficiency.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

*Assumes efficiency savings of 25% and 90%.
(See the Appendix for further details)

Graywater recovery

CO2 savings

34 848

kg carbon per year
697 kg CO_2e per resident

Water savings

264

m^3 water per year
5 280 liters per resident

Different water qualities are acceptable for different tasks, but the water that is supplied to households is safe to drink, no matter the end use. This delivery of potable water is an energy and carbon intensive process.

Graywater recovery uses scaled-down filtering processes to recycle water within a building. As a result, water that goes down a kitchen drain can be recovered with a graywater system and, with filtering, be reused for watering plants or to fill a toilet bowl, thus operating within the reduce, reuse, recycle maxim.

See Appendix

Behavioral Change

Waste Sorting

CO2 savings

2 950 (12 350)

kg carbon per year
59 (247) kg CO_2e per resident

Waste savings

2 100 (8 850)

kg waste recycled per year
42 (177) kg waste per resident

Households produce large amounts of waste, but not all waste should be processed in the same manner. The least environmentally friendly approach to waste management is to forgo sorting and either incinerate the mixed waste or send it all to a landfill. In order to avoid the use of incineration and landfills, waste must be sorted so that different waste streams can be properly processed. Recycling systems should therefore be easy to use and understand. On this front, DDS can make use of Danish know-how when it comes to recycling, as the national uptake of recycling in Denmark is 10% greater than in France.

*Assumes recycling rate targets of 42% and 100%
(See the Appendix for further details)
Note: On this front, DDS can make use of Danish know-how when it comes to recycling, as the national uptake of recycling in Denmark is 10% greater than in France.

Food Waste Avoidance

CO2 savings

652(711)

kg carbon per year
13 (14) kg CO_2e per resident

Waste savings

1 450(1 581)

kg waste recycled per year
29 (32) kg waste per resident

From production and transport to sale and consumption, all along the supply chain, food goes to waste. While the average person exists at the end of this chain, there are still ample opportunities to reduce at-home food waste. When it comes to managing a carbon footprint, the avoidance of food waste is particularly important; when food is wasted, emissions are created as the unconsumed food enters the waste stream, but also all the embodied carbon, the energy and resources expended to produce that food, were consumed in vain. Finally, there remains the ethical question of generating food waste while inequalities in food access and food scarcity between households persist.

*Assumes that the production of food waste matches French national statistics (See the Appendix for further details)

Community Composting

CO2 savings

650 (1 250)

kg carbon per year
13 (25) kg CO_2e per resident

Waste savings

3 050 (6 100)

kg waste composted per year
61 (122) kWh per resident

The importance of composting works in concert with recycling, as it ensures another waste stream avoids landfills and incineration. Biodegradable goods, whether uneaten foodstuffs or single-use items, can be identified and set aside for composting.

In addition to avoiding the perils of improper waste handling, composting can encourage or augment gardening and planting initiatives on-site, or be resold within local composting networks, helping to support urban greenspace and farming developments.

*Assumes 15% of DDS waste has composting potential.
(See the Appendix for further details)

Vegetarian Community Meals

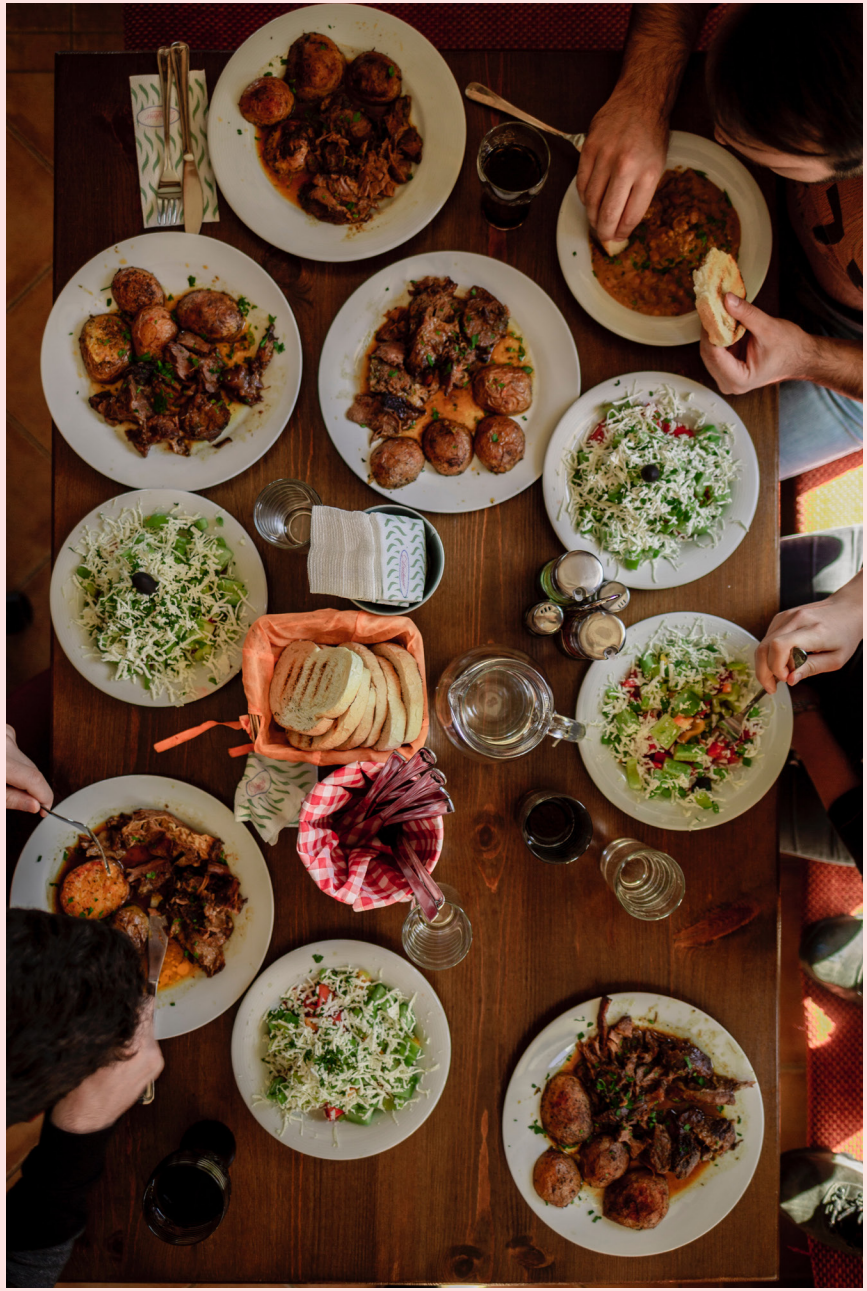
CO2 savings

1 716 (21 164)

kg carbon per year
34 (423) kg CO_2e per resident

DDS can use regular communal meals to facilitate discussions about the relationship between carbon emissions and food choices, and also use communal meals to show-off the capacity of the newly renovated kitchen. Facilitated by staff or student-led campaigns, these meals can address issues about food and the environment, opening a dialog about the impact of personal choices.

When the community gets together at the long table, a good time is sure to follow. And as always, everyone is invited!



*Assumes eat a vegetarian meal 1-2 times per week.
(See the Appendix for further details)

Partner with Local Farms

CO2 savings

20 970 (25 630)

kg carbon per year
419 (513) kg CO_2e per resident

Depending on how the meal program is structured at DDS, there are some opportunities to reduce the transportation footprint of purchased food.

Weekly trips to local farmer's markets by students or more systematic partnerships can be organized by DDS with surronding farms that can also include trips or educational endeavors.

*Assumes recycling rate tragets of 42% and 100%
(See the Appendix for further details)

Reusable Goods Welcome Package

CO2 savings

619 (991)

kg carbon per year
12 (20) kg CO_2e per resident

Waste savings

901 (1 118)

kg waste recycled per year
18 (22) kWh per resident

By offering a welcome package comprised of reusable goods to all new exchange students, DDS can help cultivate a sustainable mindset. The promotion of reusing material goods underscores the importance of reducing personal waste, signals to residents the DDS commitment to supporting a sustainable lifestyle and aligns with objectives outlined in the Paris Climate Action Plan and by the French state.

A Reusable Welcome Package could include: shopping tote, water bottle, hot cup/thermos and/or cutlery.

*Assumes the welcome package replaces disposable cup, bottle, and bag use. (See the Appendix for further details)

Start a Bike Program

CO2 savings

286 (15 900)

kg carbon per year
5,7 (318) kg CO_2e per resident

By partnering with local initiatives and creating the appropriate storage infrastructure, DDS can provide students with the information and confidence to navigate their new city on two wheels with ease, and a low carbon footprint, no less.

Bicycle support can be offered in the form of information sharing, partnering with bikeshare organizations, or investing in a DDS bicycle fleet.

3 GOOD HEALTH AND WELL-BEING
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

*Assumes recycling rate tragets of 42% and 100%
(See the Appendix for further details)

Option for Dry Line

CO2 savings

920 (1 215)

kg carbon per year
5,7 (318) kg CO_2e per resident

Simple can be elegant, and when it comes to driving behavioral change, simplicity can also improve the uptake of new habits.

Provisioning clotheslines or interior drying racks with the requisite space allows residents to avoid the use of energy-intensive drying machines, which after refrigerators, are one of the most energy-intensive appliances in a standard household.

*Assumes recycling rate tragets of 42% and 100%
(See the Appendix for further details)

Alternative travel

CO2 savings

9 100 (18 200)

kg carbon per year
182 (364) kg CO_2e per resident

Transportation represents a massive chunk of annual carbon emissions for those living in developed countries, and flying is by far the most carbon intensive way to travel. A year of careful carbon budgeting, eating and living in a low-carbon manner, can be undone by a single flight: no amount of vegetarian eating can offset the carbon emissions accrued by stepping onto the jetway.

A Scandinavian concept, flygskam, or flight shame, came to the fore as the current generation shone greater scrutiny on the environmental impact of flying. SNCF announcing renewed night service from Paris to Malmö, the journey will only get easier in the future.

Note: SNCF announcing renewed night service from Paris to Malmö, the journey will only get easier in the future.

Organizing Change

Campaigns facilitated by staff, driven by students

Behaviors and habits can last a lifetime and can adapt to changing cultural and social contexts, and unlike technologies, they can be implemented quickly and often at lower initial costs. Behaviors are learned, which means that just as residents learn new, more sustainable methods of living, they too can educate their friends, family, and community members outside of DDS.

Each successive cohort of students can offer new perspectives and insight into how DDS can develop and support new sustainability initiatives. Additionally, this method of student-sourced sustainability campaign creates a

feedback loop, as new students are connected with the latest cultural attitudes on climate change, but also offers the students a sense of autonomy, as they are ultimately responsible for driving the sustainability agenda.

The administration of one sustainability campaign per academic term offers a new group of students the opportunity to champion new or alternative behaviors and raise awareness about aspects of sustainable living that they personally find to be the most pressing or intriguing.

Examples

- Establish relationships with local recycling or composting organizations
- Learn about other sustainability initiatives and networks in Paris
- Introduce low-carbon vegan or vegetarian meal nights and discuss the relationship between carbon emissions and food, and the cultural influences on food choices

Change Starts with Culture

Culture is not static, it is constantly in flux. Use this as an advantage to reinstall new social norms into the organization. Culture manifests through a reciprocal process that can be fostered and adjusted through communication, collaboration, and behavior.

Even from the early stages of the recruitment, DDS can market its ambition to create a distinct ecosystem for thought-leadership at the Cité.

This is the beginning of DDS fostering social norms within the house that can encourage new behavior. Social norms will be easier to enforce when they are based on normative and well-communicated expectations.

These social norms will be easy to build upon though shared community practices and longterm legacy thinking by the residents.

Putting human resources at the center of an organization's capabilities is key in leveraging, carrying, and exchanging information that contributes to the processes.

With this in mind, we need to think of the residents as the biggest asset in creating transformational changes. This notion is based on the idea that humans represent important social capital in engaging in system-change.

Thus, it is crucial for DDS management to identify dynamic thought-leaders to be drivers of the sustainability agenda.

Identifying Sustainable Change Makers

There is a unique opportunity for DDS to capitalize on the findings of the anthropological report of residents by extending leadership positions to residents who are seeking a platform for personal development and evolution.

By working with the existing Resident Committee structure, DDS management can introduce Sustainability Ambassador positions that can be tasked with leading campaigns throughout their tenure.

These positions can be screened and applied for during the initial recruitment process or can be democratically implemented by the students themselves.

These student-led positions are imperative for taking the temperature of what sustainability initiatives and ambitions are viable and desirable by each student constellation.

Recommendations for Actions:

- **Are these students keen in building a legacy around sustainability regarding the food and agricultural sector or will they aim to not consume any single use plastic during their stay?**
- **These student ambassadors are key stakeholders to drive the agenda forward in new ways and for making the sustainability campaigns uniquely personal to each cohort of residents.**
- **In addition to creating the social glue that drives sustainability initiatives forward, these Sustainability Ambassadors can step into these positions with ideas and ambition that can elevate their future academic and professional dreams.**

Building Organizational Capacity

DDS needs to provide a stable foundation so sustainable behavior can persist and evolve from year to year.

To start this process, we recommend:

- Identify key resources to spearhead the sustainability agenda with DDS management mapping out resources and stakeholders
- Set up a flexible framework for students to relay knowledge, success, and challenges within sustainability campaigns
- Create ECTS fieldwork opportunities attached to sustainability campaigns to drive participation and academic reward
- Set up incentives for student campaigns such as quarterly parties to acknowledge celebratory behavior
- Set up a steering committee to share knowledge and set up milestones (made up of DDS management, residents, and external advisors)
- Encourage students to consider key performance drivers to be part of campaigns to measure progress and goals

Enrolling at DDS: Day One

On the first day students arrive to DDS, they will have an immersive sense of the sustainability culture that they are contributing to. This day is important to underscore this culture as the new normal during their stay in Paris.

During the campus tour, go over in detail the sustainability renovations of the house and how this is apart of a bigger ambition for the DDS program to meet the targets outlined in the Paris Accords.

Hand out the DDS Welcome Package equipping the students with the tools needed to immediately reduce their carbon footprint.

As the students are eager to venture out into their new city, highlight the available options for sustainable mobility, whether that is a Bike Program facilitated by DDS or a public option that the students can opt into via a mobile app.

Point out how they can participate in Waste Sorting and what the French guidelines are, pointing out signs or guides in the kitchen that can act as sustainable wayfinding.

DDS staff can introduce the constellation's Sustainability Ambassadors, if preselected, or the positions can be introduced for interested individuals.

In this scenario, the students are introduced to the embedded sustainability that the house innately facilitates while being presented with the new norms that they are enthusiastically asked to step into and champion - beginning a new journey for the residents and the Danish Student House.