THE LIVING BUILDING CHALLENGE SPURS PROJECTS TO HAVE THEIR OWN UTILITY, GENERATE THEIR OWN ENERGY, CAPTURE THEIR OWN WATER, AND PROCESS THEIR OWN WASTE. YET, THE IDEAL SCALE FOR SOLUTIONS IS NOT ALWAYS WITHIN A PROJECT’S PROPERTY BOUNDARY.

Depending on the technology, the optimal scale can vary when considering environmental impact, first cost and operating costs. To address these realities, the Living Building Challenge has a Scale Jumping overlay to allow multiple buildings or projects to operate in a cooperative state—sharing green infrastructure as appropriate and allowing for environmental and social benefits to be achieved as elegantly and efficiently as possible. Refer to the summary table on page 19 to view all Imperatives that may employ the Scale Jumping overlay.

Please note that some projects may scale from the Living Building Challenge program to the Living Community Challenge℠ program, Standards that are designed to work together.

Imperatives where scale jumping are allowed are marked with this icon.

6 Refer to the v4.0 Petal Handbooks for more information on Scale Jumping by Imperative.
Registration is the first step toward Living Building Challenge certification and is accessible through ILFI membership. Registered projects can benefit from many Institute resources, such as the opportunity to submit program clarification and exception requests through the Dialogue. To register a project, teams will need to provide basic information about the project, owner, and team, most of which can be updated later as the project evolves.

Once projects have completed construction and a 12-month performance period, they can certify under one of the many certification paths.
LIVING BUILDING CHALLENGE CERTIFICATIONS
The Living Building Challenge is a holistic standard, requiring projects to strive for the ideal across the seven Petals. Therefore, both certification options under the LBC require consideration of all the Petals as described in this Standard.

LIVING CERTIFICATION
Living Certification is for projects striving for the highest level of sustainability and regenerative design. A project achieves Living Certification by attaining all Imperatives assigned to its Typology. All twenty Imperatives are required for New Buildings, and the other Typologies have similar, but scope dependent requirements.

PETAL CERTIFICATION
Petal Certification is for projects that want to do a deep dive into one particular issue area, or Petal of the Living Building Challenge. This certification requires the achievement of all the Core Imperatives, in addition to all Imperatives in either the Water, Energy, or Materials Petal.
CORE GREEN BUILDING CERTIFICATION
Core Green Building Certification (Core Certification) is for projects seeking a high aspiration certification that is verified, holistic and readily achievable. Projects must meet the requirements of the ten Core Imperatives – up to two Core Imperatives per Petal – and verify performance for water and energy through a twelve month performance period. All Imperatives required for this certification are described in this Standard, and are consolidated into the Core Green Building Certification Standard.

ZERO ENERGY CERTIFICATION
Zero Energy (ZE) Certification is for projects focused on achieving net zero energy through the on-site production of renewable energy. The marketplace has characterized net zero energy in many different ways, but ILFI has a simple definition:

One hundred percent of the building’s energy needs on a net annual basis must be supplied by on-site renewable energy, with no combustion.

ZERO CARBON CERTIFICATION
Zero Carbon (ZC) Certification is for projects focused on impacting climate change through energy and materials. This certification requires that one hundred percent of the operational energy use associated with the project be offset by new on- or off-site renewable energy. It also requires a targeted energy efficiency level and a reduction in the embodied carbon of the project’s primary materials.\(^7\) In addition, one hundred percent of the carbon emissions impacts associated with the construction and materials of the project must be disclosed and offset.

For additional information about membership, registration and certification, including links, see pages 74 + 75.

\(^7\) See glossary and v4.0 Materials Petal Handbook for more information.
IT’S TIME TO CREATE A LIVING FUTURE
PLACE
Restoring a Healthy Relationship Between Nature, Place and Community

I-01 ECOLOGY OF PLACE
I-02 URBAN AGRICULTURE
I-03 HABITAT EXCHANGE
I-04 HUMAN-SCALED LIVING
Petal Intent

The intent of the Place Petal is to realign how people understand and relate to the natural environment that sustains us. The built environment must reconnect with the ecology of place and the unique characteristics found in every community so that story can be honored, protected and enhanced. The Place Petal clearly articulates where it is acceptable for people to build, how to protect and restore a place once it has been developed, and how to encourage the creation of communities that are once again based on the pedestrian rather than the automobile. In turn, these communities need to be supported by a web of local and regional agriculture that encourages the consumption of local, fresh and seasonal food.

The continued spread of sprawl development and the vastly increasing number of global megalopolises threaten the few wild places that remain. The decentralized nature of our communities impedes our capacity to feed ourselves in a sustainable way and also increases transportation impacts and pollution. The overly dense urban centers in turn crowd out healthy natural systems, isolating culture from a sense of place. As prime land for construction diminishes, more development tends to occur in sensitive areas that are easily harmed or destroyed. Invasive species threaten ecosystems, which are already weakened by the constant pressure of existing human developments. The impact of single-occupancy fossil fuel vehicles on global climate change is devastating. Fortunately, alternatives are plentiful from public transit and car sharing to electric vehicles and bicycles.

Ideal Conditions + Current Limitations

The Living Building Challenge envisions a world full of compact, connected communities with healthy rather than inhumane levels of density—inherently conserving the natural resources that support human health and the farmlands that feed us, while also inviting natural systems back into the daily fabric of our lives. As previously disturbed areas are restored, the trend is reversed, and nature’s functions are invited back into a healthy interface with people.

Human behavior and attitudes are the most significant barriers to transforming our surroundings. As the global population reaches unprecedented levels, the pressures to develop previously undeveloped land are even stronger than before and the solutions to develop in a restorative and healthy fashion even more imperative.
The intent of this Imperative is to protect wild and ecologically significant places and encourage ecological regeneration and enhanced function of the communities and places where projects are built.

All projects must avoid building on pristine greenfield, wilderness, prime farmland or in a floodplain unless they meet an exception. Projects must preserve thriving vibrant ecological environments and habitats.

All project teams must document site and community conditions prior to the start of work, including but not limited to identification of the project’s “reference habitat(s)”.

All projects must demonstrate that they contribute positively to the ecology of their place and restore or enhance the ecological performance of the site towards a healthy ecological baseline. On-site landscape must be designed to mature and evolve, and emulate the functionality of the reference habitat, as appropriate to the project’s Transect.

All project teams must assess cultural and social equity factors and needs in the community and consider those identified needs to inform design and process decisions.

No petrochemical fertilizers or pesticides can be used for the operation and maintenance of the on-site landscape, including urban agriculture.

---

8 Refer to the v4.0 Place Petal Handbook for exceptions to the limits on project locations.
9 Refer to the v4.0 Place Petal Handbook for more information regarding the emulation of the reference habitat, including specific aspects to consider.
The intent of this Imperative is to integrate opportunities for connecting the community to locally grown fresh food.

All projects must dedicate a portion of their total project area to growing food, or they must dedicate a smaller portion of their total project area to growing food and must also directly provide weekly community access to healthy local food that address a community need, through farmers markets, CSA programs or other local food producers.10

<table>
<thead>
<tr>
<th>LIVING TRANSECT</th>
<th>PATHWAY 1 Agriculture only</th>
<th>PATHWAY 2 Agriculture + food access</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5%</td>
<td>2% + weekly access</td>
</tr>
<tr>
<td>2</td>
<td>20%</td>
<td>10% + weekly access</td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
<td>7% + weekly access</td>
</tr>
<tr>
<td>4</td>
<td>10%</td>
<td>5% + weekly access</td>
</tr>
<tr>
<td>5</td>
<td>5%</td>
<td>2% + weekly access</td>
</tr>
<tr>
<td>6</td>
<td>2%</td>
<td>0% + weekly access</td>
</tr>
</tbody>
</table>

Scale jumping can be used as the means to expand the availability of healthy, local food (through agriculture or other means) to a specific population or the community in general via an off-site location such as a food bank, school, or other community resource.

Resilience Strategy
All projects (except residential projects) must provide access to food for 75% of FTE occupants for a minimum of three days during an emergency.

Residential projects must demonstrate the capacity to store at least a two-week supply of food.

10 Refer to the v4.0 Place Petal Handbook for clarifications of the types of agriculture that are acceptable as well as some ideas for healthy food access compliance.
The intent of this Imperative is to protect land for other species as more and more land is taken for human use.

All projects must set aside land equal to the project area (or 0.4 hectares/1 acre, whichever is greater) away from the project site, in perpetuity, through an approved Land Trust organization or the Institute’s Living Future Habitat Exchange Program.12

---

11 Refer to the v4.0 Place Petal Handbook for clarifications, exceptions and other information. ILFI now operates the Living Future Habitat Exchange Program in cooperation with conservation organizations.
The intent of this Imperative is to contribute toward the creation of walkable, pedestrian-oriented communities that reduce the use of fossil fuel vehicles.

All projects must maintain or increase the density of the site and support a human-powered lifestyle.

All projects (except single family residential) must also:

- Be built to a human scale that is appropriate for the neighborhood.
- Provide places for occupants to gather and connect with the community.
- Provide sufficient secure, weather-protected storage for human-powered vehicles and facilities, such as showers and lockers, to encourage biking.  
- Provide at least two electric vehicle charging stations or one per thirty spaces, whichever is greater.
- Minimize impervious surface parking to no more than 20% (Transects 1-3), 15% (Transect 4), 5% for (Transect 5) and 0% (Transect 6) of the Project Area and ensures that any surface parking area larger that 20m x 30m is separated with planted areas.

13 Projects must demonstrate how they have addressed on-site bike storage opportunities in order to meet the intent of this imperative.

14 For maximum parking guidelines refer to the 4.0 Place Petal Handbook.
Either reduce single-occupancy vehicle (SOV) trips and trips by fossil fuel-based vehicles by 30% over an established baseline relevant to the projects region and occupancy type, or

- Implement at least four of the following best practices:
  - Consideration and enhancement of pedestrian routes, including weather protection on street frontages.
  - Advocacy in the community to facilitate the uptake of human-powered and public transportation.
  - A transit subsidy for all occupants of the building (if owner occupied) or a requirement for tenant employers to provide such a subsidy.
  - Carpool coordination assistance.
  - Access either to subsidized car sharing and/or to hybrid or EV fleet vehicles.
  - Regular survey of occupants to determine current fossil fuel-based SOV trips.

Single-family homes (all Transects) must assess how occupants can reduce their transportation impact through car sharing, use of public transportation, alternative fuel vehicles, or bicycles and implement at least two identified strategies.
Creating Developments that Operate within the Water Balance of a Given Place and Climate

I-05 RESPONSIBLE WATER USE
I-06 NET POSITIVE WATER
PETAL INTENT

The intent of the Water Petal is to realign how people value water; to address the energy and chemicals involved in transporting, purifying and pumping water; and to redefine “wastewater” as a precious nutrient and resource.

The scarcity of water is a serious issue, as many countries around the world face severe shortages and compromised water quality due to global climate change. Even regions that have avoided the majority of these problems to date due to a historical presence of abundant fresh water are at risk: the impacts of climate change, highly unsustainable water use patterns, and the continued drawdown of major aquifers suggest significant problems ahead. Closed loop systems based on the resources available, with localized treatment, can help mitigate these issues and create a more resilient water future.

IDEAL CONDITIONS + CURRENT LIMITATIONS

The Living Building Challenge envisions a future whereby all developments are configured based on the carrying capacity of the site: harvesting sufficient water to meet the needs of a given population while respecting the natural hydrology of the land, the water needs of the ecosystem the site inhabits, and the ecosystem of the community. Indeed, water can be used and purified and then used again—and the cycle repeats.

Currently, such practices are often illegal due to health, land use, and building code regulations (or because of the undemocratic ownership of water rights) that arose precisely because people were not properly safeguarding the quality of their water. Therefore, reaching the ideal for water use means challenging outdated attitudes and technology with decentralized site- or district-level solutions that are appropriately scaled, elegant, and efficient.
The intent of this Imperative is to encourage projects to treat water like a precious resource, minimizing waste and the use of potable water, while avoiding downstream impacts and pollution.

All projects must not use potable water for irrigation, and use less water for the project’s other needs than a baseline regional building of the same type at the following rates:\textsuperscript{15}

- New Building: 50%
- Existing Building: 30%

Affordable housing projects can use water handprinting combined with project efficiency to meet water savings goals.\textsuperscript{16}

All projects must treat all stormwater on site, through natural or mechanical means and without chemicals, and manage all stormwater based on both pre-development hydrology and current ecological conditions, as determined by a qualified professional.

All projects on a Combined Sewer Overflow (CSO) system, or in a floodplain (based on an exception) must incorporate stormwater detention and avoid sheet flow off the site.

\textsuperscript{15} Refer to the 4.0 Water Petal Handbook for clarifications and exceptions, including an exception based on jurisdictional refusal of the designed systems. That exception does not apply to irrigation systems.

\textsuperscript{16} There are two ways to create a Handprint: (1) Preventing or avoiding Footprints that would otherwise have occurred, which includes reducing the magnitude of Footprints that occur, relative to what their magnitude would otherwise have been; and (2) Creating positive benefits which would not otherwise have occurred, without impacting the Footprint. All change occurs relative to some baseline, often referenced as “business as usual,” or BAU.
The intent of this Imperative is for project water use and release to work in harmony with the natural water flows of the site and its surroundings.

All projects must supply one hundred percent of the project’s water needs through captured precipitation or other natural closed-loop water systems, and/or through recycling used project water, and all water must be purified as needed without the use of chemicals. No potable water may be used for non-potable uses.

All projects must address all grey and black water through on-site treatment and management through reuse, a closed loop system, or infiltration. Projects that are not able to treat and manage on-site may use handprinting within their watershed and community.

Scale jumping strategies are allowed with some limitations. For example, connecting to a community or municipal facility is allowed only if the facility treats waste to tertiary levels, reuses or infiltrates all water in balance with the water shed, and has a biologically based treatment process with no chemicals. For all scale jumping, pump energy must be accounted for through renewable energy sources.

All projects must incorporate a resilience strategy to provide drinking water for up to a week for all regular building occupants through water storage on-site.

---

17 Refer to the v4.0 Water Petal Handbook for clarifications and exceptions, such as exceptions based on local health regulations.
18 Refer to the Water Petal Handbook for clarifications and exceptions, such as exceptions based on local health regulations.
Relying on Renewable Resources

I-07 ENERGY + CARBON REDUCTION

I-08 NET POSITIVE CARBON
PETAL INTENT

The intent of the Energy Petal is to create new sources of renewable energy that allow projects to operate year-round in a resilient, carbon pollution-free manner. In addition, the Energy Petal prioritizes energy efficiency as a means to reduce wasteful spending, of energy, resources, and capital.

Today, buildings consume more energy than any other final use. Most of the energy generated for these buildings is from ecologically destructive and often politically destabilizing sources that include coal, gas, oil, and nuclear power. Large-scale hydro, while inherently cleaner in generation, comes at the expense of widespread disruption to ecosystems. Combustion of wood pellets and other biomass can release particulates and carbon dioxide (CO2) into the atmosphere that can affect public health or strain land reserved for food production while robbing the soil of much-needed nutrient recycling. The combined negative impacts of this energy infrastructure are becoming increasingly evident, as ever-increasing carbon emissions from energy use are resulting in changes to the climate that threaten the safety and prosperity of communities worldwide.

The Energy Petal attempts to establish a new paradigm for humans’ relationship with energy, in which the places we live, work and play become catalysts for a healthy and resilient future.

IDEAL CONDITIONS + CURRENT LIMITATIONS

The Living Building Challenge envisions safe, resilient and decentralized energy infrastructure, one powered entirely by renewables. The energy grid will supply power equitably to incredibly efficient buildings that do not contribute to the negative externalities associated with combustion or fission.

Although considerable progress has been made to advance the cost-effectiveness and performance of renewable energy technologies, many projects still perpetuate fossil fuel energy infrastructure due to cost or regulatory barriers. In order to truly realize the social, ecological and economic benefits of clean energy, there must be even more urgency placed on move away from combustion-based energy sources. Storage of energy in the form of batteries or advanced materials will also enable teams to more effectively utilize the energy harvested on site and support the phasing out of short-term combustion needs on the utility grid.
The intent of this Imperative is to treat energy as a precious resource and minimize energy-related carbon emissions that contribute to climate change.

All projects must achieve a reduction in total net annual energy consumption (after accounting for on-site renewable power), as compared to a typical existing building with comparable climate, size, use and occupancy, and combustion must be limited as follows:¹⁹

<table>
<thead>
<tr>
<th></th>
<th>NEW BUILDING</th>
<th>EXISTING BUILDING</th>
<th>INTERIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY PERFORMANCE</td>
<td>70% reduction from an equivalent building baseline</td>
<td>50% reduction from an equivalent building baseline</td>
<td>35% reduction from an equivalent building baseline</td>
</tr>
<tr>
<td>REQUIREMENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMBUSTION LIMITS²⁰</td>
<td>Not Allowed (except through existing exceptions)</td>
<td>Allowed for HVAC systems that are not in project scope. Phase out plan and advocacy are required.</td>
<td></td>
</tr>
<tr>
<td>RENEWABLES</td>
<td>Must be on-site to count towards the efficiencies above.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All projects must meter energy used by the project.

New or Existing Building projects must demonstrate a twenty percent reduction in the embodied carbon of primary materials compared to an equivalent baseline.²¹ Existing Buildings may count in-situ materials against the required twenty percent.

All projects (except Landscape + Infrastructure) must select interior materials with lower than industry average carbon footprint for product categories for which embodied carbon data is readily available.²²

All projects must be designed to be “zero ready” through strategies such as designating area(s) and/or pre-installing wiring and connections for both electric vehicle charging and future installation of renewable energy systems.

¹⁹ Projects must establish their baseline through using tools such as Zero Tool, World Bank EDGE or other approved tools.
²⁰ The allowance for Existing Buildings & Interiors is only for Imperative 07, Energy + Carbon Reduction. Combustion is not allowed, except through an exception, for Imperative 08, Net Positive Carbon.
²¹ Refer to the v4.0 Energy Petal Handbook for recommended tools to establish a baseline
²² Refer to the v4.0 Energy Petal Handbook for relevant interior product categories and industries averages.