Forests of Our Future

Image: Forest City, LAVA

Meet the team of Engineers!

Sarah Hodson

Uluc Degirmenci

Griffin Jerrier

Hajer Ghaus

Manhattan, 1609

Image: The Welikia Project

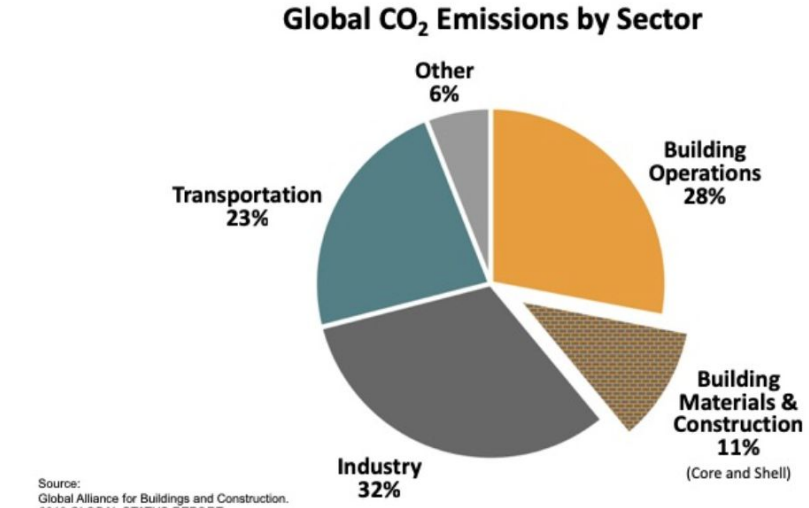
Manhattan, 2018

15 Mt CO_2!!

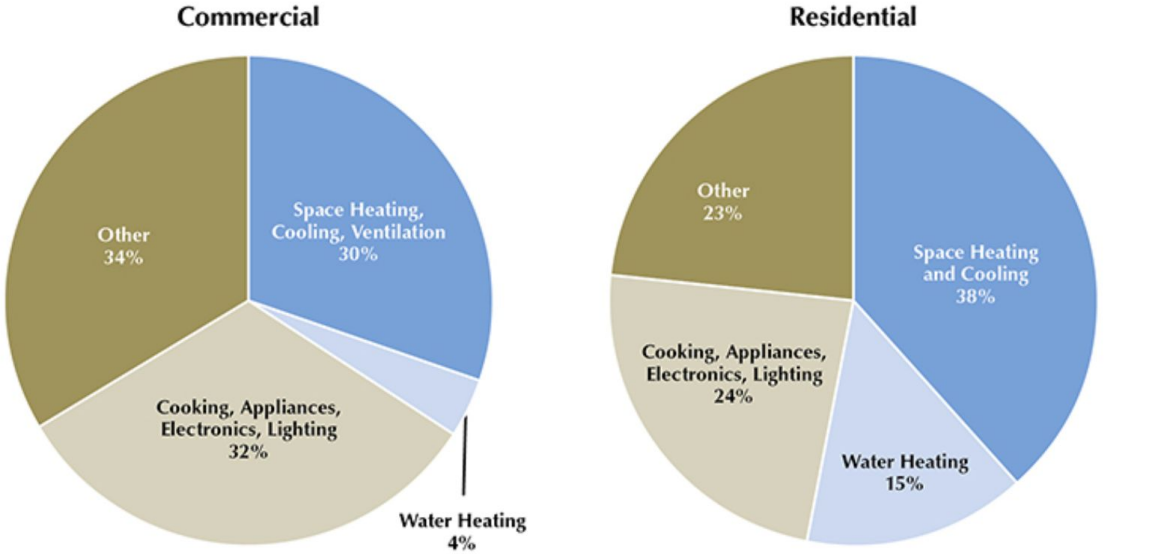
Image: Street Easy

In fact...

The operations of buildings account for 28% of global emissions, and 72% of the entire building sector emissions.



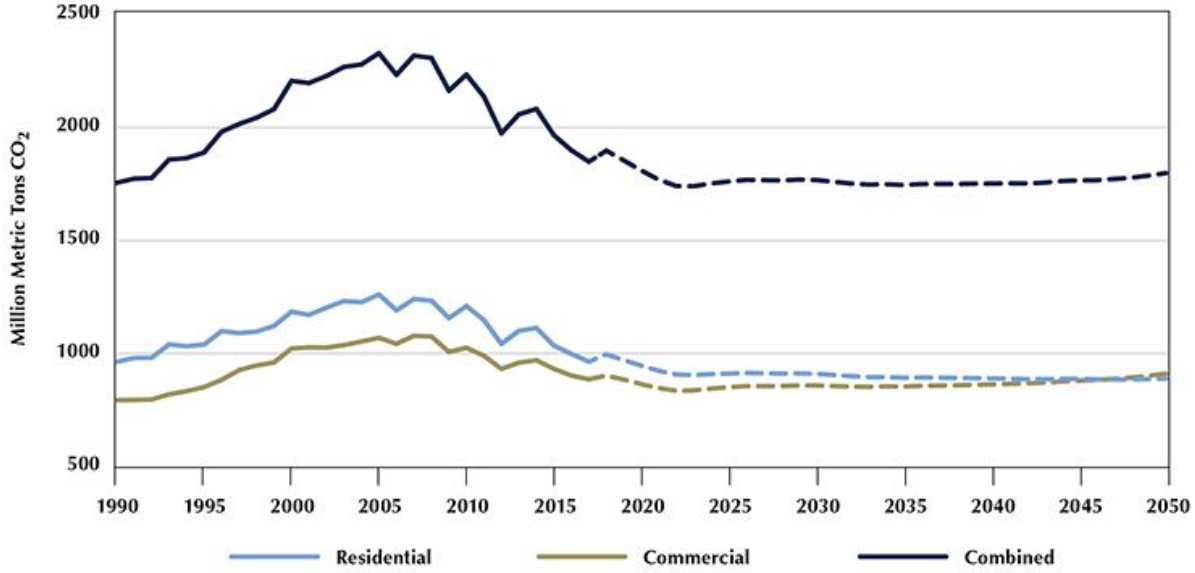
Building Operations



"Other" in both the commercial and residential sector includes items such as data servers, medical imaging equipment, ceiling fans, and pool pumps which are categorized as "miscellaneous electric loads" by EIA.

Source: U.S. Energy Information Administration, Annual Energy Outlook 2018 *(Washington, DC: U.S. Department of Energy, 2018), https://www.eia.gov/outlooks/aeo.*

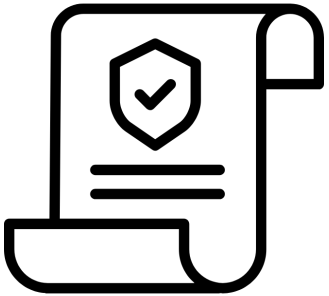
Residential buildings are the focus of our strategy because they contribute to more emissions than commercial buildings.



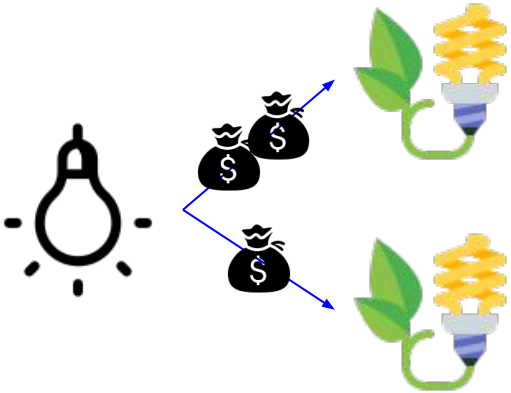
Source: U.S. Energy Information Administration, Monthly Energy Review February 2018, DOE/EIA-0035(2018/02) (Washington, DC: U.S. Department of Energy, 2018), https://www.eia.gov/totalenergy/data/monthly and U.S. Energy Information Administration, Annual Energy Outlook 2018 (Washington, DC: U.S. Department of Energy, 2018), https://www.eia.gov/outlooks/aeo.

Defining the Problem State

Lacking Policy & Enforcement of Energy Conservation



Accessibility & Affordability



Unsustainable Growth

Our goal?

Reduce building emissions by 50% by the year 2030.

What will that take?

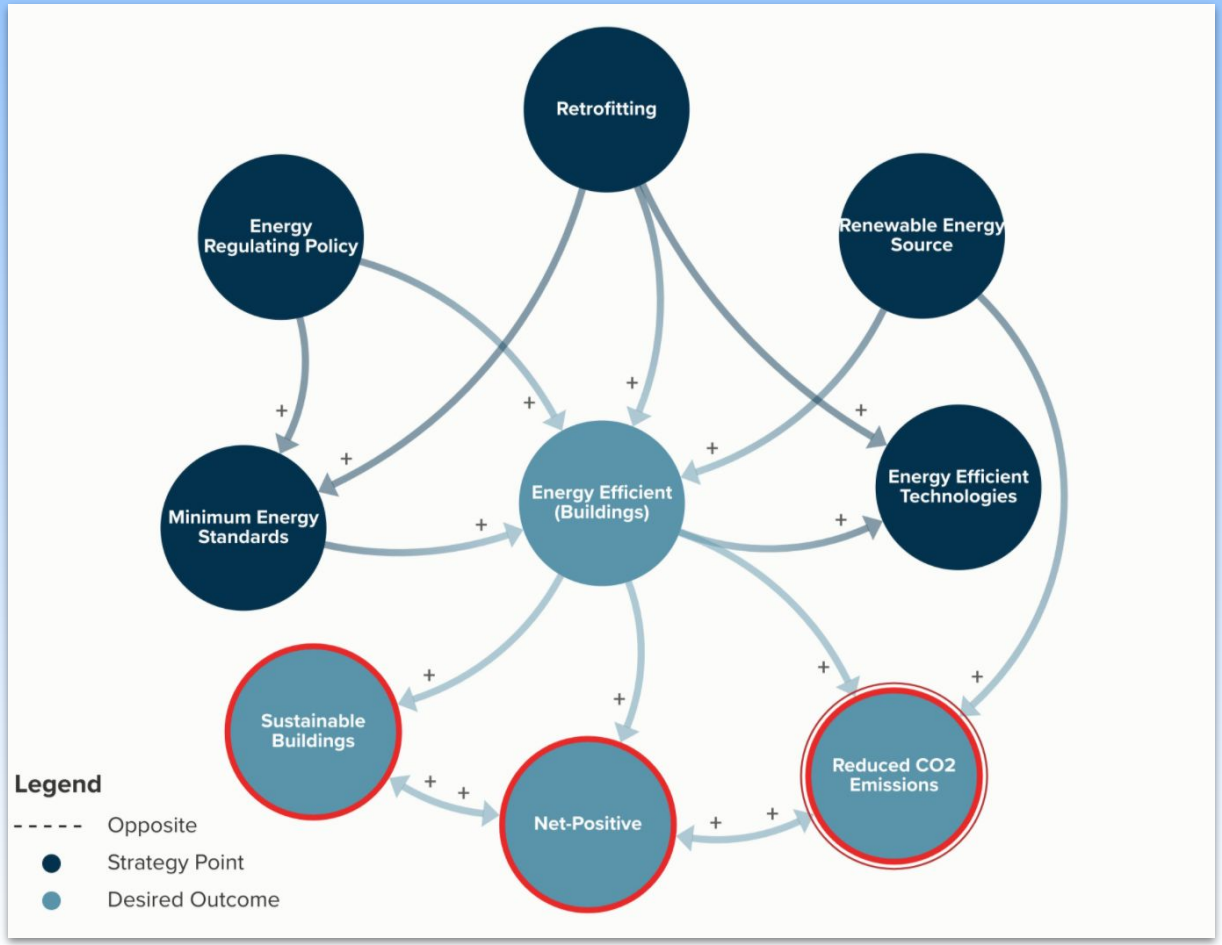
- Overcome system inequity that exists in the accessibility and affordability of green technologies.
- Perspective shift: See buildings as part of the ecological context.

Our Mission

“Making use of the space we have by retrofitting to improve energy efficiency, encouraging the complete transition to renewable energy sources, minimizing new construction and re-using vacant spaces to provide affordable housing and a built environment in harmony with nature.”

Preferred System
By 2030

Preferred System Map



Three Main Areas of Intervention:

1. **Policy:** Stringent building energy standards and strict enforcement
2. **Retrofitting:** Affordable energy efficient technologies
3. **Clean Energy:** Transitioning to renewably sourced electricity

Exponential Roadmap Forecast

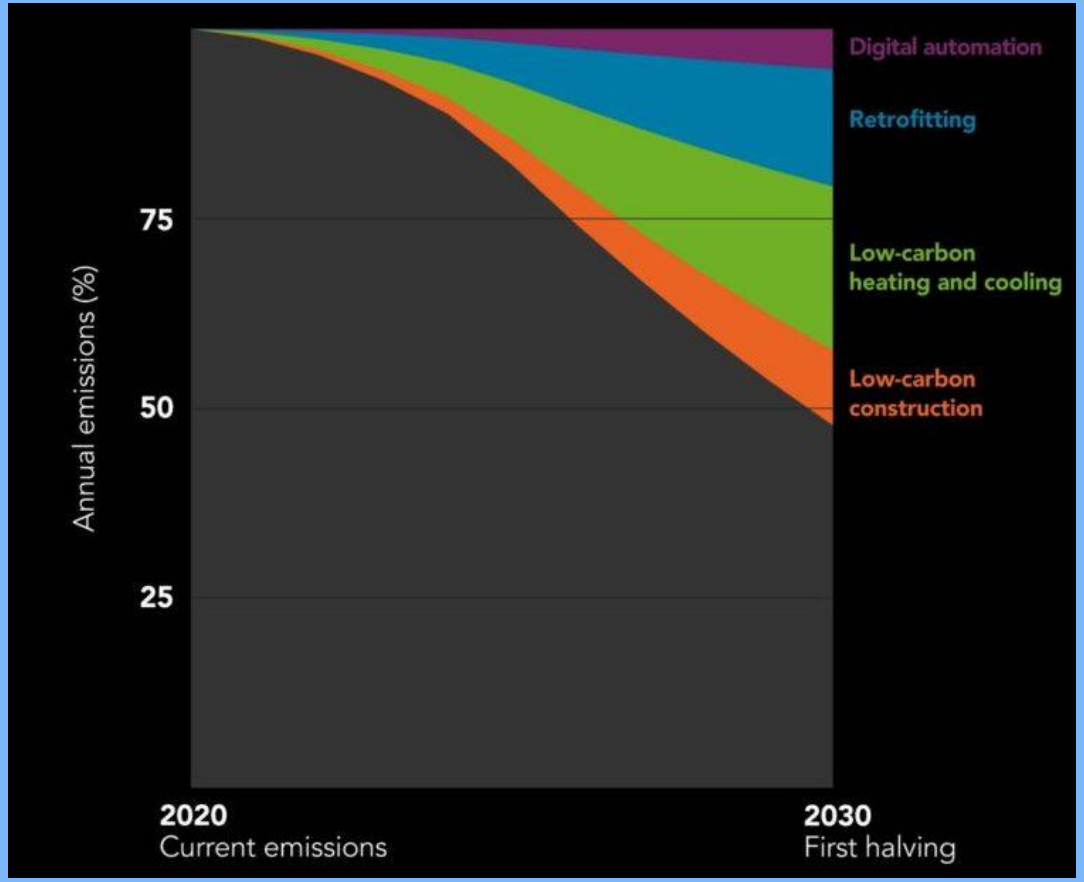
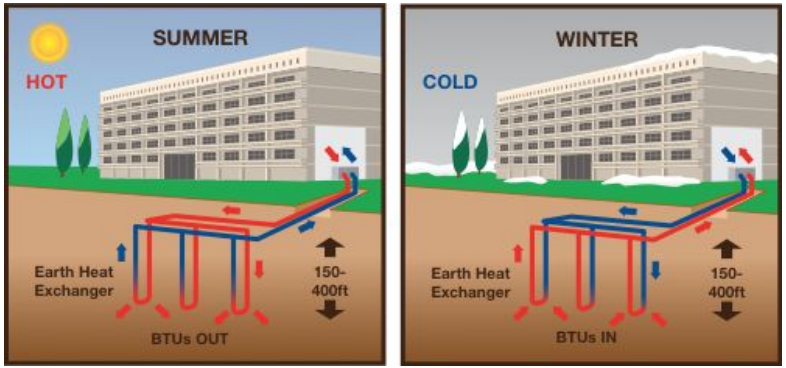
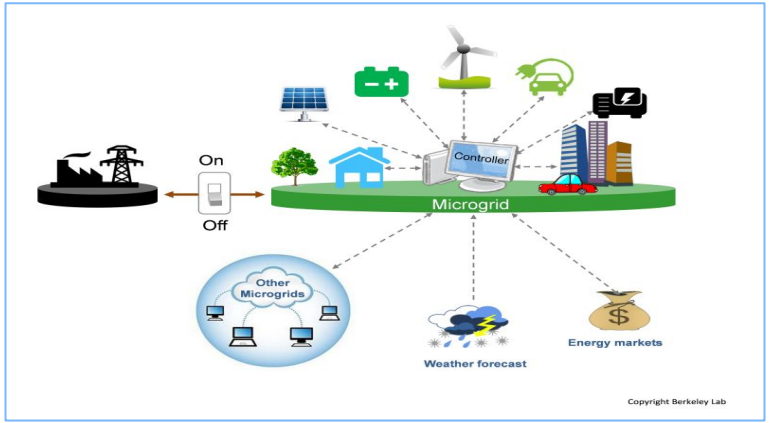


Image: Exponential Roadmap

Energy Efficient Heating/Cooling: Heat Pumps



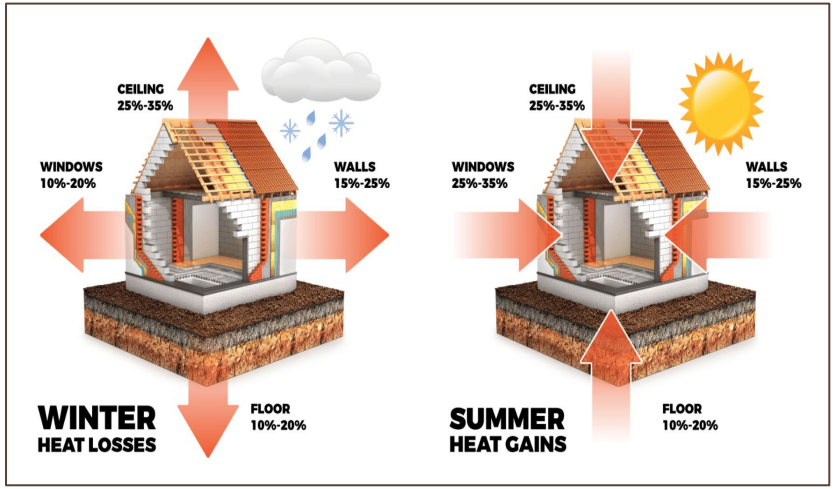
Residential Solar Power Systems and Microgrids



LED Lighting

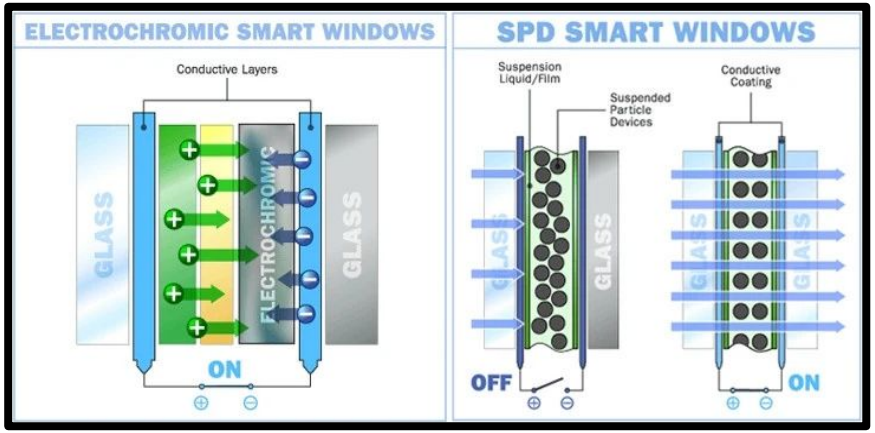
Source: Phys.org

Improved Insulation



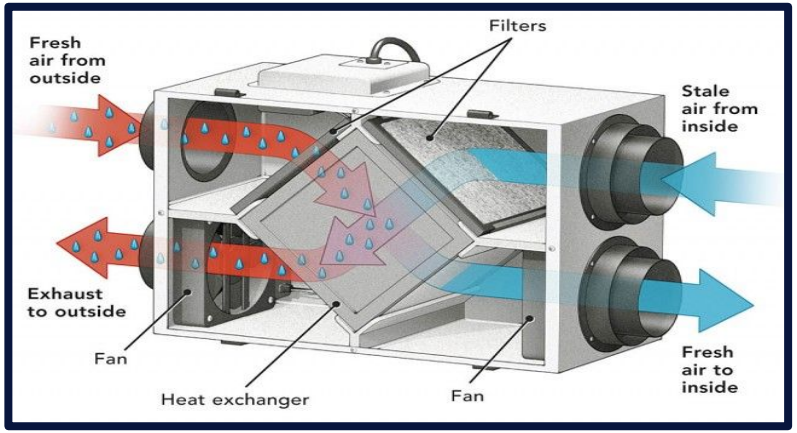
Source: 4 Seasons Home Insulation

Energy Efficient Windows



Source: msesupplies.com, "Smart window Market Expected to Grow to more than $5.8 Billion by 2020."

Energy Efficient Ventilation Systems



Source: epsalesinc.com, "Heat Recovery Ventilator (HRV) vs Energy Recovery Ventilator (ERV): What's the Right Unit for Your Home?"

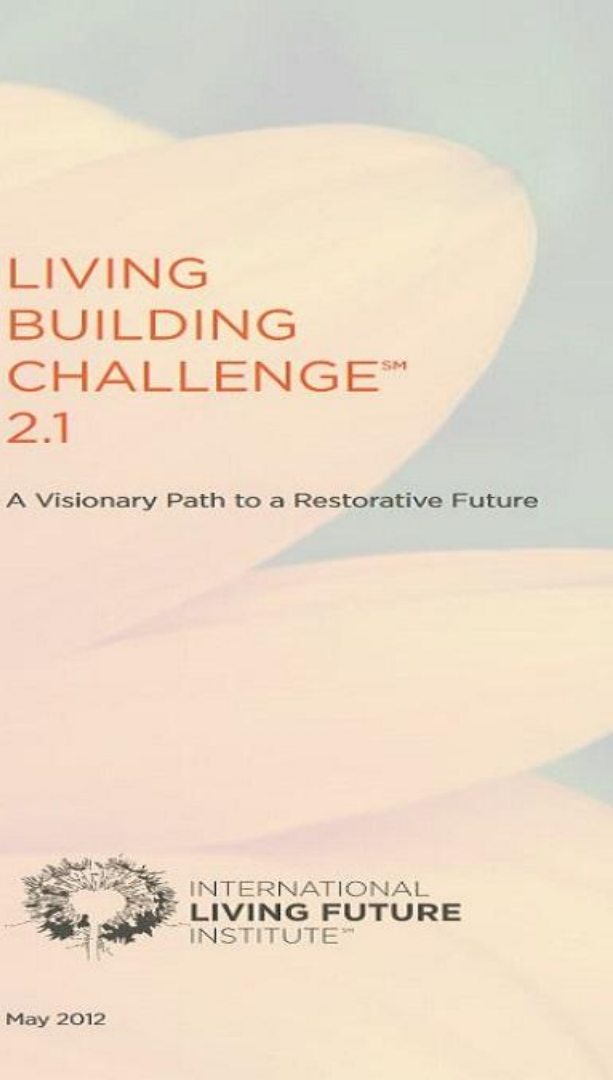
How are we going to accelerate the transition to living buildings?

International Living Future Institute

SOCIALLY JUST, CULTURALLY RICH, ECOLOGICALLY RESTORATIVE

Living Building Challenge:

Create buildings that generate more energy than they use, capture and treat all water on site, and are made using healthy materials.



Implementation Plan

2020-2030

Implementation on four levels:

1. Global: international collaboration to achieve 2030 goals
2. Regional: country and state-wide strategies
3. City/Community: solutions specific to cities and neighborhoods
4. Home: individual projects to reduce home energy use

At a Global Scale

Present (2020-22):

- Creation of a global organization to develop and implement planetary scale building standards

Short Term (2023-27):

- Continued R&D leading to mass production and reduced costs of energy saving technologies

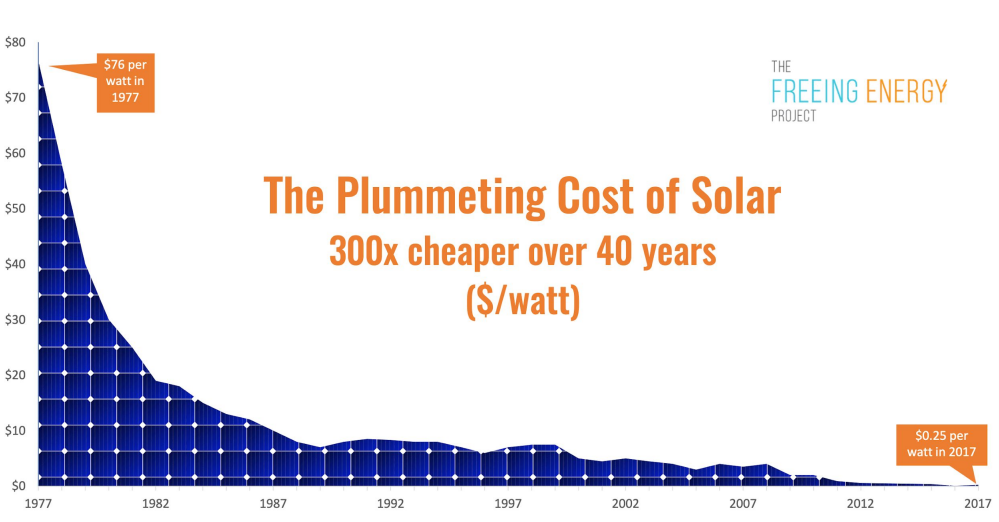


Image:Freeing Energy

At a Regional Level

Present (2020-22):

- Increased awareness of retrofit technologies
- Every country establishes their own standards of minimum building energy efficiency

Medium Term (2028-30):

- Building energy codes are updated yearly with the guidance of a global organization

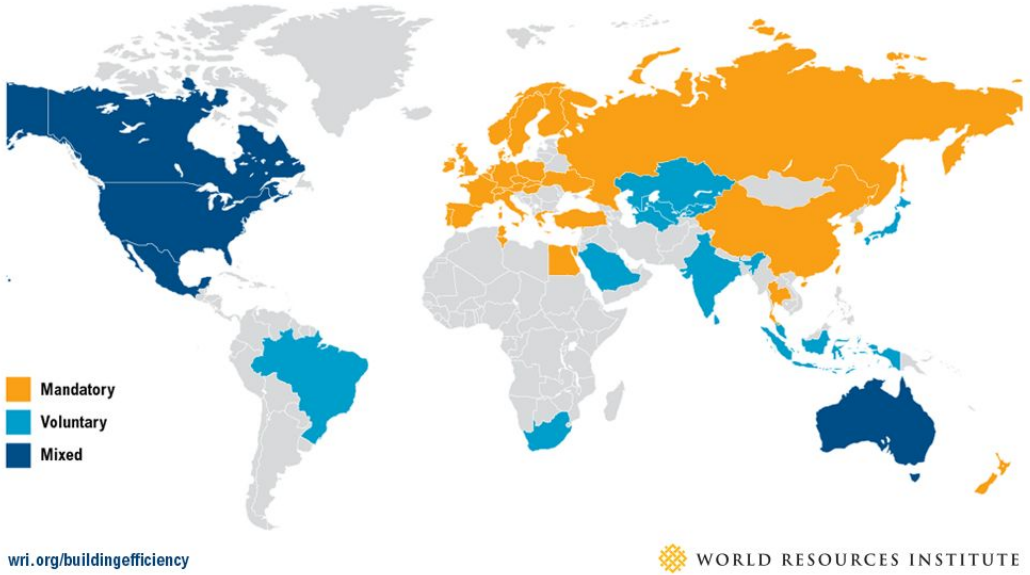


Image: World Resources Institute

At a City/Community Level

Present (2020-22):

- Streamlined permit process and waived fees
- Solar panels considered for all new construction
- Programs established to fund retrofitting for low-income households

Short Term (2023-27):

- Planning and development of community microgrids from local renewable sources

Image: EnergySage

At Home

Present (2020-22):

- Installation of LED lights and programmable thermostats

Short Term (2023-27):

- Electric heat pumps replace furnaces
- Installation of Energy Recovery Ventilation (ERV)
- Solar panels installed where effective

Medium Term (2028-30):

- Homes are net-positive towards the energy grid, using solar to contribute excess energy back to the grid

Will this work in developing countries?

Not exactly, our plan is directed towards developed nations.

However, developing countries have a unique opportunity to skip fossil fuel dependence, while still continuing growth.

WORLD GREEN BUILDING COUNCIL

SUSTAINABLE DEVELOPMENT GOALS

Green buildings can improve people's health & wellbeing

Green buildings can use renewable energy, becoming cheaper to run

Building green infrastructure creates jobs & boosts the economy

Green building design can spur innovation & contribute to climate resilient infrastructure

Green buildings are the fabric of sustainable communities & cities

Green buildings use 'circular' principles, where resources aren't wasted

Green buildings produce fewer emissions, helping to combat climate change

Green buildings can improve biodiversity, save water resources & help to protect forests

Through building green we create strong, global partnerships

3 GOOD HEALTH AND WELL-BEING

7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

15 LIFE ON LAND

17 PARTNERSHIPS FOR THE GOALS

GEF Sustainable Cities Program

GEF financing to date: $151.6 million; Total Co-financing: $2.4 billion

Initially engaging 28 cities in 11 developing countries (Brazil, China, Cote d'Ivoire, India, Malaysia, Mexico, Paraguay, Peru, Senegal, South Africa, and Viet Nam)

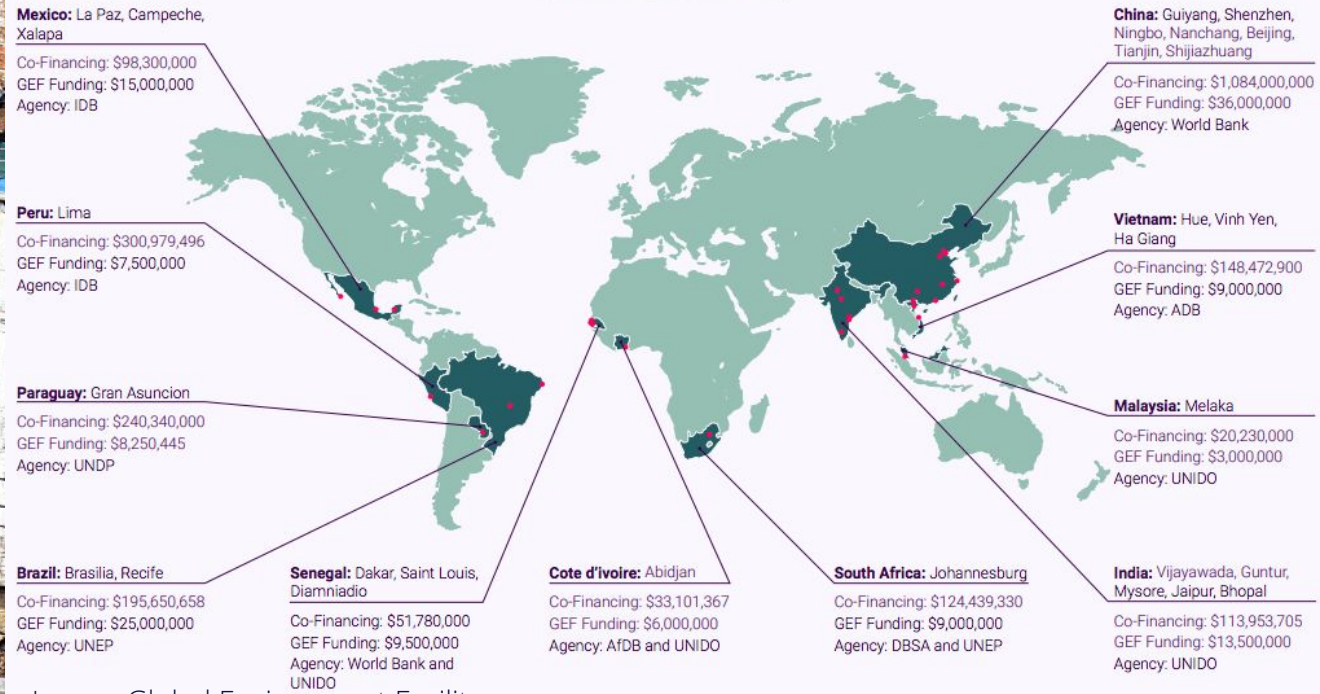
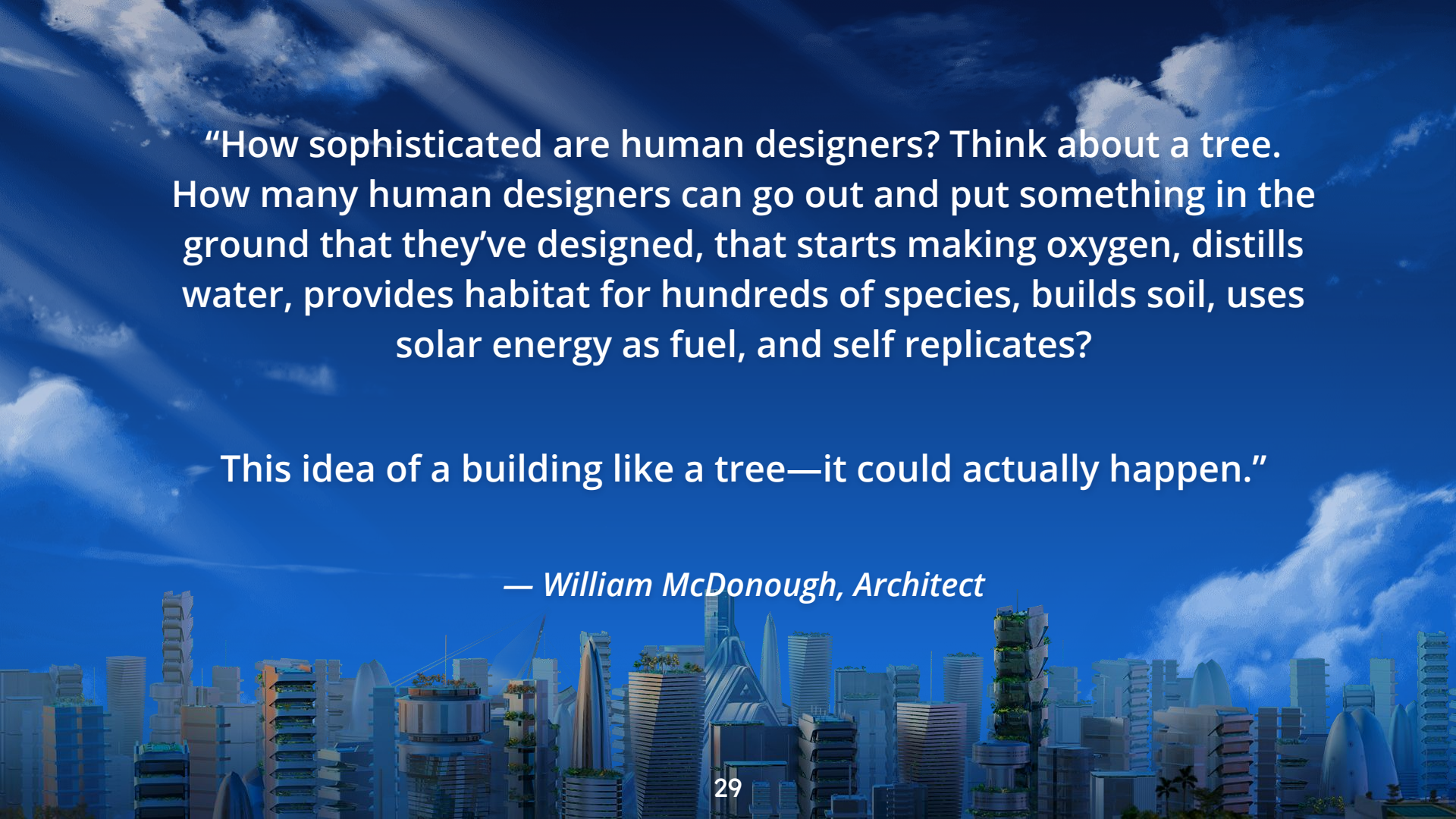


Image: Global Environment Facility

- Facilitate knowledge sharing between leadership
- Develop and deploy common standards and tools to enhance credibility
- Enhance the capacity of local leadership (resources, training, etc.)
- Provide finance for selected low-carbon infrastructure


“How sophisticated are human designers? Think about a tree. How many human designers can go out and put something in the ground that they’ve designed, that starts making oxygen, distills water, provides habitat for hundreds of species, builds soil, uses solar energy as fuel, and self replicates?
This idea of a building like a tree—it could actually happen.”
— William McDonough, Architect

THANKS FOR LISTENING!

Any questions?