Us

Home

Stores

Cities

Regions

Generative AI & Sustainability

Innovative tools for environmental management

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Theo Fernandes

2023

Us

Source https://2030.builders/articles/how-to-create-sustainable-behaviour-change-in-your-life-and-work/

Us

Behavior change

Us

Social influence

- “When people learn they are using more energy than their neighbours, they decrease their energy usage”

Habits

- Apply penalties for bad behavior
- Reward good behavior

Individual self

- Health
- Self-efficacy
- Self-consistency

Source

https://theconversation.com/5-ways-to-shift-consumers-towards-sustainable-behaviour-120883

Us

Personal environmental sustainability quiz

1. I put my computer into “sleep mode” instead of using the screen saver.

2. I make a deliberate effort to buy products with little packaging.

3. I only print documents when I absolutely need to.

4. I recycle paper at my residence instead of putting it in the regular trash.

5. I recycle glass at my residence instead of putting it in the regular trash.

6. I recycle plastic products at my residence instead of putting them in the regular trash.

7. I shut off my computer completely when not in use.

8. I keep electronic devices (e.g., computers, toasters, printers, chargers) unplugged when not in use.

9. I walk, bike, carpool, or ride the bus to work or school.

10. I take short showers (less than 10 minutes long)

Source

https://www.psychologytoday.com/us/blog/presence-mind/201504/the-personal-environmental-sustainability-behavior-quiz

Us

Us

Personal environmental sustainability quiz

11. I drink tap water instead of bottled water.

12. I compost my kitchen trash.

13. I take my showers in a shower with a low-flow showerhead.

14. When I buy an appliance or TV, I buy an energy-efficient one.

15. I use recycled paper.

16. My mobility patterns are sustainable

16. I am minimizing air travel

16. My diet is sustainable

16. I am guided by eco-labelling in my purchases

20. I try to maximize consumption of local products

https://www.psychologytoday.com/us/blog/presence-mind/201504/the-personal-environmental-sustainability-behavior-quiz

Us

Us

Twelve ways to live more sustainably

Think twice before shopping.

Make sure your big purchases have big environmental benefits.

Go #PlasticFree.

Boycott products that endanger wildlife.

Pay attention to labels.

Be water wise.

Drive less, drive green.

Green your home.

Choose Wild Energy.

Take Extinction Off Your Plate.

Choose to have a smaller family.

Use your voice and your vote.

Source

https://www.biologicaldiversity.org/programs/population_and_sustainability/sustainability/live_more_sustainably.html

Us

Us

Personal apps driving pro-sustainability behavior

Good on You

Too Good to Go

Open Invest

Oroeco

How Good

Source

https://www.emerald.com/insight/content/doi/10.1108/TG-07-2021-0118/full/html

Home

Our home

Larvik, Norway. It has solar panels covering its sloped roof. The house's geometry, orientation, and glass panels' placement are adjusted to achieve passive heating and cooling. https://www.arch2o.com/sustainable-houses/

Home

Our home

The Ecocapsule was designed as an independent alternative to settling down in one place. The design uses solar, wind and rainwater to allow for off-the-grid living from anywhere. https://www.thegoodtrade.com/features/eco-friendly-homes

Home

Our home

To make your home sustainable look at:

- Building materials and methods
- Decorating choices
- Insulation
- Windows
- Heat, ventilation and air conditioning
- Lighting
- Appliances
- Plumbing fixtures
- Use of smart systems (locks, security alerts, thermostats, smart assistants, smart appliances, smart light bulbs)
- Energy generation from solar and wind
- Your habits when it comes to regular maintenance, conservation and green cleaning

Source https://blog.constellation.com/2020/01/07/ways-to-make-your-house-more-sustainable/

Our home

Building a sustainable home

Home

Energy efficient design

Passive heating and cooling

Use of recycled and sustainable house materials

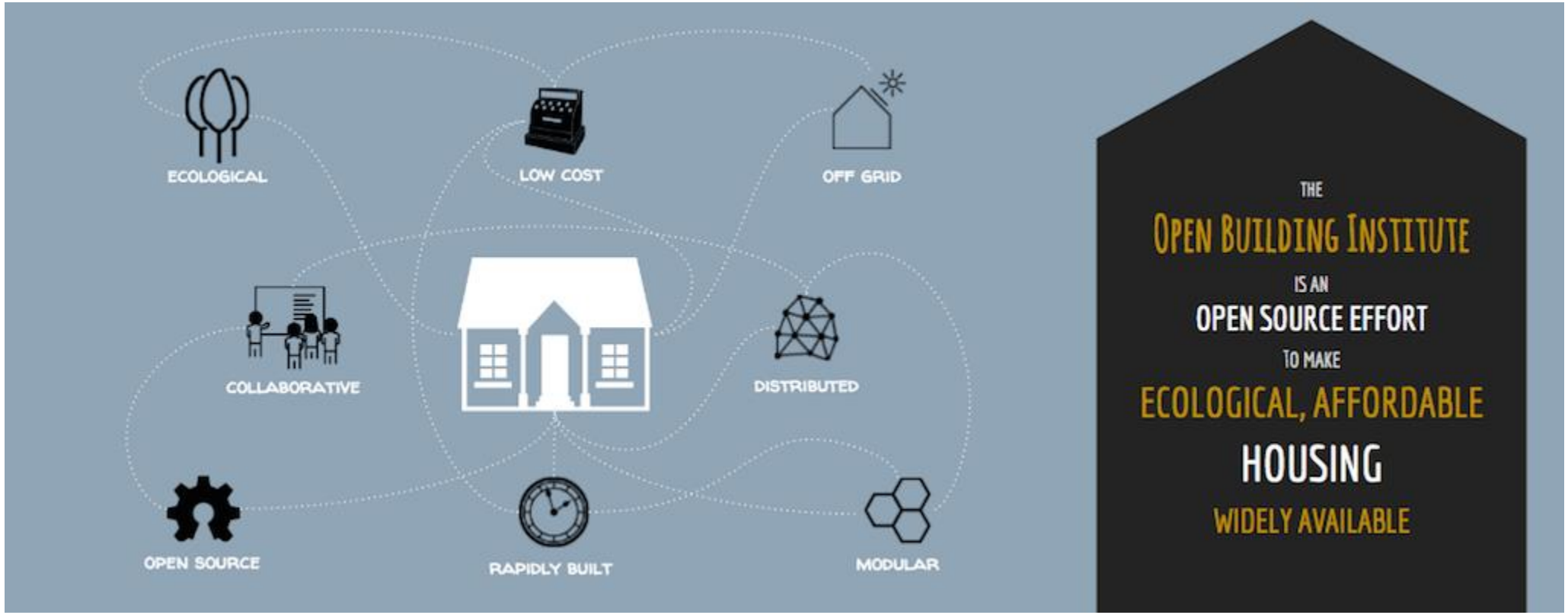
Wastewater treatment & water conservation

Installation of smart lighting

Source https://www.architectureanddesign.com.au/features/list/the-rise-of-sustainable-homes

Home

Our home



Source https://www.openbuildinginstitute.org/

Stores

Local sustainable stores

Ethical online stores

Home stores

Food52 Vintage Shop

Accompany

EarthHero

The Little Market

Verishop

Clothing stores

Made Trade

Azura Bay

ourCommonplace

Source

https://www.sustainablejungle.com/sustainable-living/ethical-online-shopping/

Stores

Local sustainable stores

Ethical online stores

Beauty stores

All Natural Collection

Etsy

EcoRoots

etee

Grocery stores

The Wally Shop

Thrive Market

Azure Standard

Source https://www.sustainablejungle.com/sustainable-living/ethical-online-shopping/

Stores

Eco-shops

Made Trade

Earth Easy

EcoRoots

Earth Hero

Life without plastic

Package free shop

Source https://greendreamer.com/journal/eco-shops-for-all-your-needs

Stores

Zero waste stores in Lisbon

Maria Granel

Mind the Trash

Sapato Verde

Celeiro

Biomercado

Stores

Designing sustainable stores

Using biodegradable features

Using climate control systems

Leed-certified stores (‘leadership in energy and environmental design’)

Healthier earth, healthier body

Educating with rewards

Source

https://www.thedesignstory.com/blog/tips/tips-5-key-takeaways-when-designing-sustainable-retail-stores

Cities

Sustainability in cities

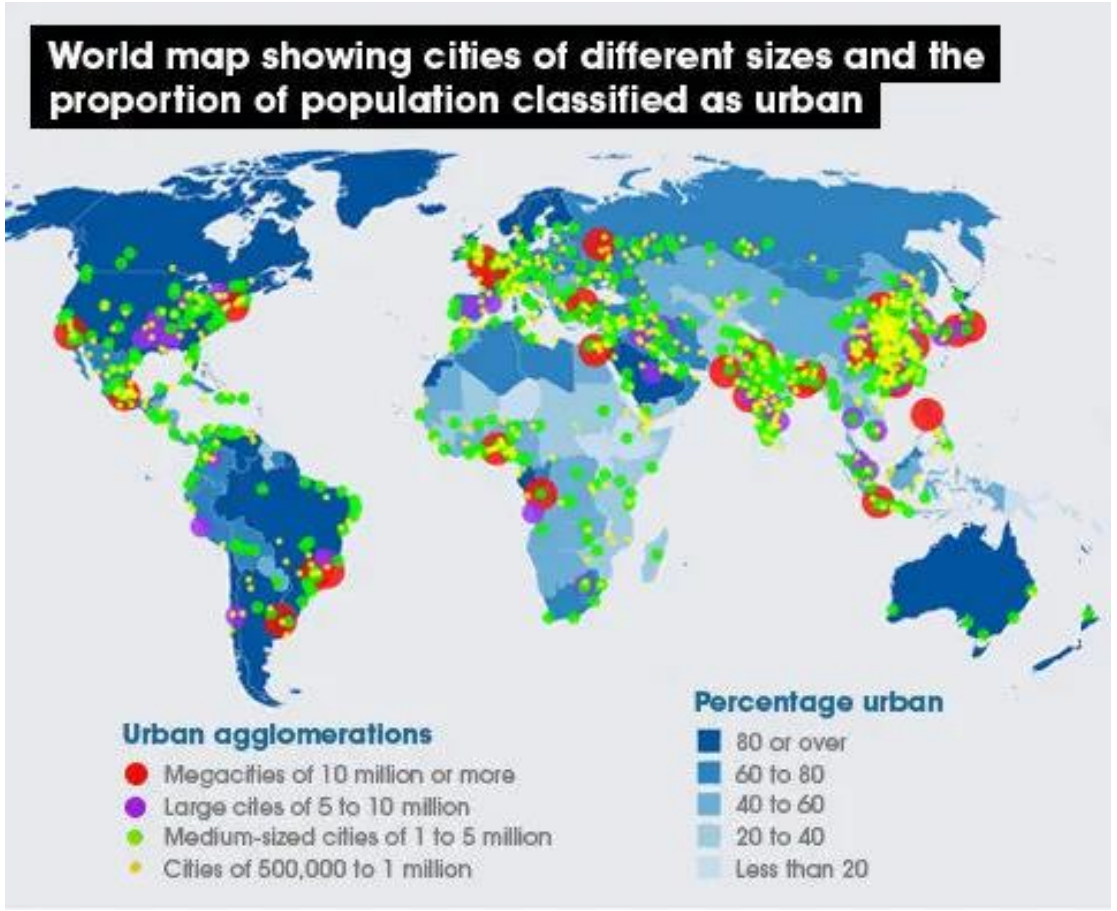
By 2050, two thirds of world population — 6.2 billion people — may live urban lives

Megacities: 10 million or more

Large Cities: 5 to 10 million

Medium Cities: 1 to 5 million

Small Cities: 500,000 to 1 million



Source https://www.scidev.net/global/features/transforming-cities-sustainability-facts-figures/

Cities

Sustainability in cities

Key challenges

Poverty

Urban poverty (people living on less than US$1 day) has grown by 13 per cent in the past 10 years, so that 28 per cent of urban residents are now said to be living in poverty

Energy

In most low- and middle- income nations, around 30 per cent of city dwellers lack access to electricity or heating fuels

Food

People living on low incomes in urban areas are particularly vulnerable to fluctuating prices. For example, in 2003 in Tanzania, local food prices jumped by 81 per cent of the change in the global corn price.

Source https://www.weforum.org/agenda/2020/09/cities-sustainability-innovation-global-goals/

Cities

Sustainability in cities

Key challenges

Transport

Traffic congestion is a challenge for urban areas. Apart from the mobility problems, it has negative impacts on human health: traffic-related air pollution is linked to a higher risk of death from respiratory and cardiovascular disease

Solid waste

Municipalities in developing countries often spend up to half of their budgets on waste management. Still, it's not unusual for 30-60 per cent of solid wastes to be left uncollected, and for solid waste services to reach less than half of the population

Water and sanitation

Poor drainage of sewerage and other waste water leaves many people living in polluted environments

Source

https://www.weforum.org/agenda/2020/09/cities-sustainability-innovation-global-goals/

Cities

Sustainability in cities

Key challenges

Health

Pollution favors disease transmission through air, water and insect vectors

Climate change

The largest share of greenhouse gas emissions comes from urban areas — about 70 per cent globally

Disaster risk

Urban areas tend to attract vulnerable populations and are often poorly equipped to deal with disasters and extreme events

Housing

Globally, one billion people — most in developing countries — live in inadequate shelters.

Source https://www.weforum.org/agenda/2020/09/cities-sustainability-innovation-global-goals/

Cities

Sustainability in cities

Innovative solutions

Hyperlocal economic development

Off-the-grid renewable energy sources

Urban farming & city forests

Smarter commuting

Milan, Italy

Cities

Sustainability in cities

Innovative solutions

- 15 minute neighborhood
- Sponge city
- Circular economy
- DIY for housing

Seattle, Washington

https://lisboa---cidade-de-15-minutos.webnode.pt/

Source

https://www.disruptive-technologies.com/blog/the-top-20-sustainable-smart-cities-in-the-world

Cities

Sustainability in cities

Major obstacles

- Rising housing prices
- Inequality
- Pollution
- Climate change

Source https://www.greenbiz.com/article/why-sustainable-cities-are-hitting-wall

Source https://thebulletin.org/2019/08/early-adopters-in-confronting-climate-cities/

Regions

Sustainability in regions

Source

https://www.sdgindex.org/reports/europe-sustainable-development-report-2021/

Regions

Sustainability in regions

Leading European projects

Accelerating Energy Transition
Sustaining Renewables Sources
Highway to Eco-mobility
Tackling Energy Poverty
Circular Economy
Healthy Environment, Healthy Citizens
Educating, training and raising awareness

Source

https://fedarene.org/publication/sustainable-regions-in-action-2021/

Regions

Sustainability in regions

Sweden

Norway

Switzerland

Finland

Source https://www.norden.org/en/sustainable-development

Environmental sustainability

cities and regions

Regions

Recognize the value of the natural resources

Protect the bio-diversity of the species

Protect the health of productive ecosystems, such as agricultural land and livestock, making them sustainable

Promote the energetic transition by using renewable energy sources

Designing products, goods and services through a project (eco-design) based on the attention of the environment for all life stages (from cradle to grave)

Mitigate the effects of climate changes

Source https://www.bearing-news.com/environmental-sustainability-and-measurements-tools/

Regions

Environmental sustainability

cities and regions

Adoption of practices based on circular economy principles

Preservation and protection of the territory and bio diversities

Promotion of the renewable energy sources and efficient use of resources

Recycle and optimal waste management

Promotion of the sustainable mobility

Development of innovative technologies for environment

https://www.bearing-news.com/environmental-sustainability-and-measurements-tools/

Environmental sustainability

companies in cities and regions- issues

Regions

Compliance with the current legislation

Quantity of raw materials used

Supply chain: life cycle of the product

Social impact

Environmental effects

Regions

Environmental sustainability

companies in cities and regions- measures

Quantification and localization of the emissions sources

Determination of one's own Carbon Intensity

Identification and management of risks and responsibilities related to harmful emissions of greenhouse gases

Project, development and application of initiatives and programs aimed at the reduction of pollutants

Implementation of compensation and neutralization actions through the promotion of reforestation processes and/or protection of existing forests

Creation of a reference to compare own performances with those ones of competitors

Achievement of an environmental label for the organization. Create Environmental and Energy Management systems

Sustainability analysis tools

Risk assessment

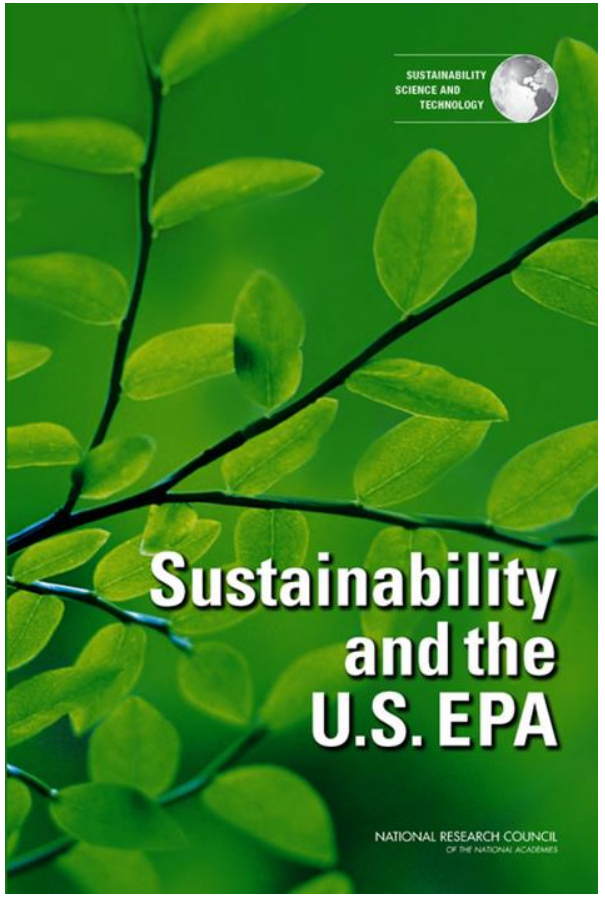
A tool used for characterizing the adverse human health and ecologic effects of exposures involving: a hazard identification, dose-response assessment, exposures assessment and risk characterization

Life cycle assessment

Life-cycle assessment is a “cradle-to-grave”
analysis of environmental impacts from production, use, and eventual disposal of a product

Benefit-cost analysis

A widely used tool to evaluate the net benefits of alternative decisions



https://doi.org/10.17226/13152

Sustainability analysis tools

Ecosystem services valuation

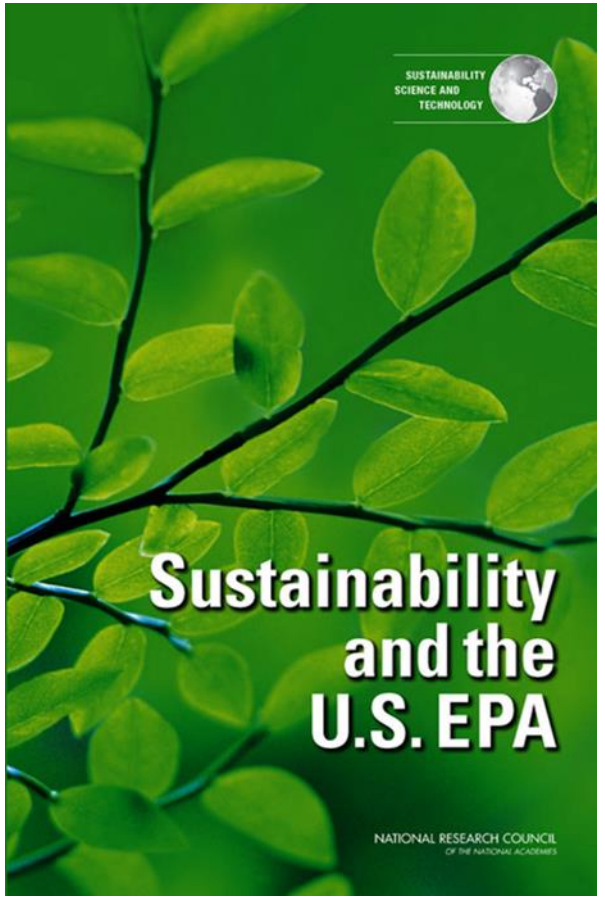
Ecosystem-service valuation is an attempt to measure the relative benefits of ecosystem services n a common metric

Integrated assessment models

Such as the Global Change Assessment Model (GCAM), bringing together global circulation models and economic models to assess the probable benefits and costs of alternative energy- and climate-policy choices

Sustainability impact assessment

To analyze the probable effects of a particular project or proposal on the social, environmental, and economic pillars of sustainability



https://doi.org/10.17226/13152

Sustainability analysis tools

Environmental justice tools

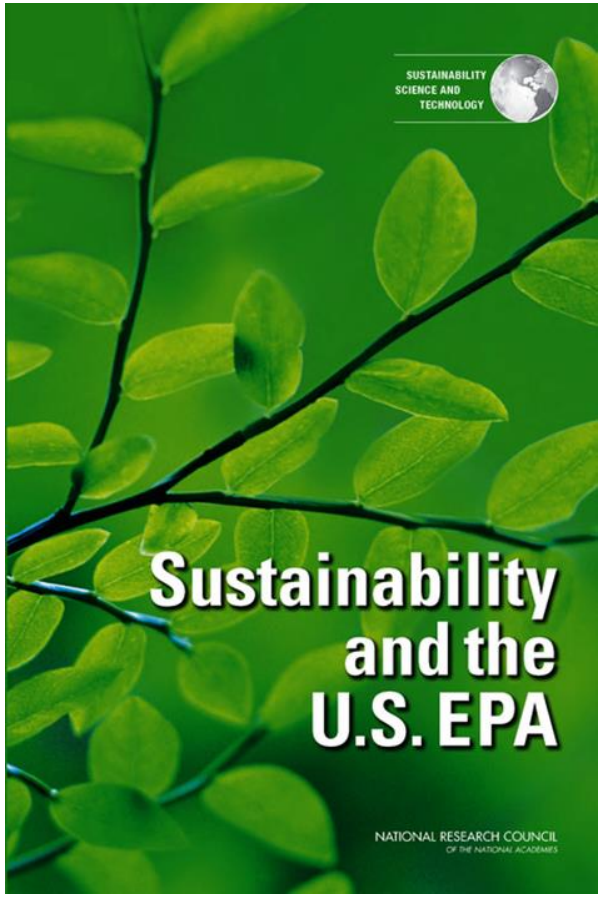
Analytic methods for judging whether communities are experiencing excessively high environmental and health burdens and for evaluating the sustainability of communities

Present conditions and future scenario tools

The evaluation of present and future conditions to show that present decisions and actions are not compromising future human and ecologic health and well-being

Trade-off and Synergy analysis

The objective is to maximize synergies (social, environmental, and economic benefits of a decision) and to minimize the adverse effects of conflicts among the three pillars.



https://doi.org/10.17226/13152

Sustainability tools for the built environment

Building Research Establishment Environmental Assessment Method (BREEAM)

An environmental rating scheme that awards credits based on sustainability considerations

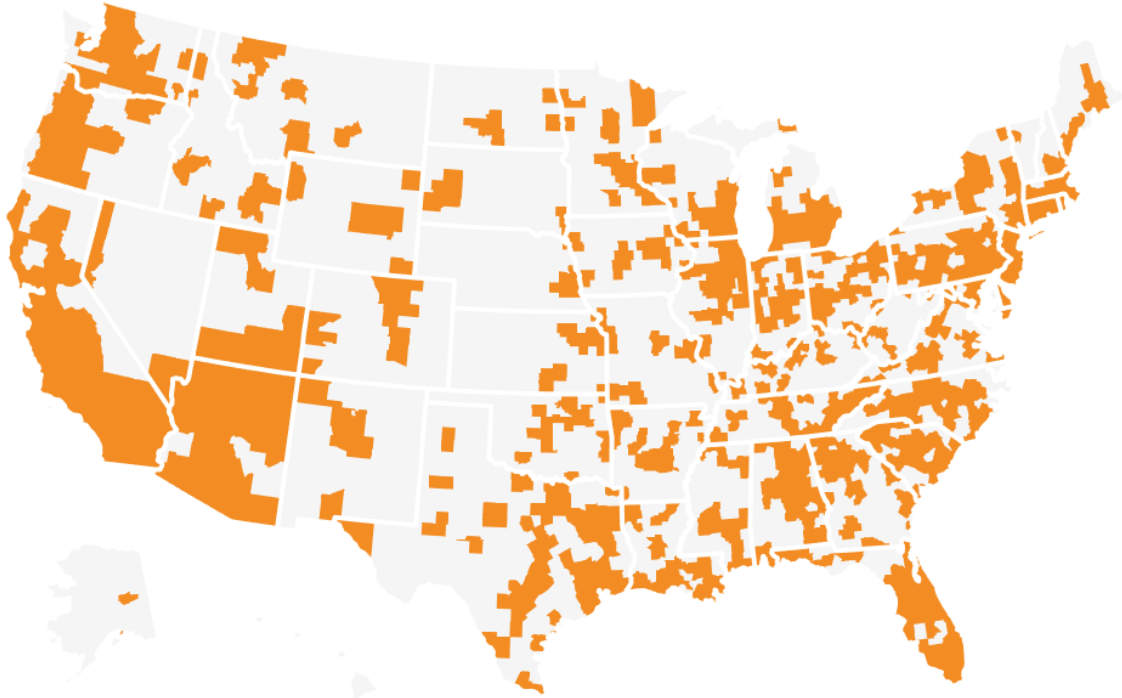
Leadership in Energy and Environmental Design (LEED)

A similar North-American tool which sets benchmarks for building sustainability

https://www.smartcitiesdive.com/ex/sustainablecitiescollective/five-sustainability-tools-built-environment-and-beyond/19260/

https://www.designingbuildings.co.uk/wiki/Designing_for_sustainability:_Tools_to_help_you_design_greener

Sustainability tools, a digital approach



Area wide solar potential

https://sustainability.google/technology/tools/

https://normative.io/

https://sustainability.aboutamazon.com/environment/the-cloud/asdi

https://www.nbs.net/articles/digital-tools-can-bring-sustainability-to-scale

Open-source ecology

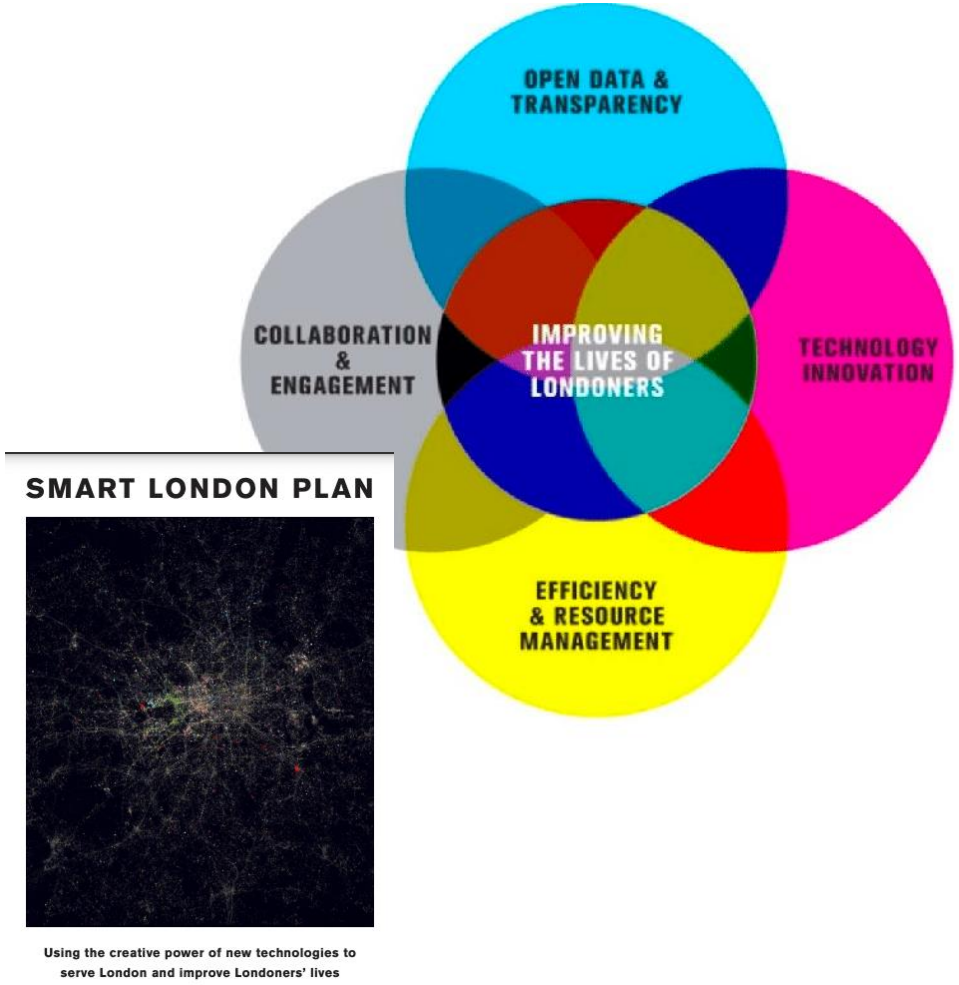
https://www.opensourceecology.org/

Generative AI

Cities

London Smart Plan

Uses generative AI to optimize energy usage, improve transportation systems, and manage waste.



Generative AI

San Francisco Urban Festival

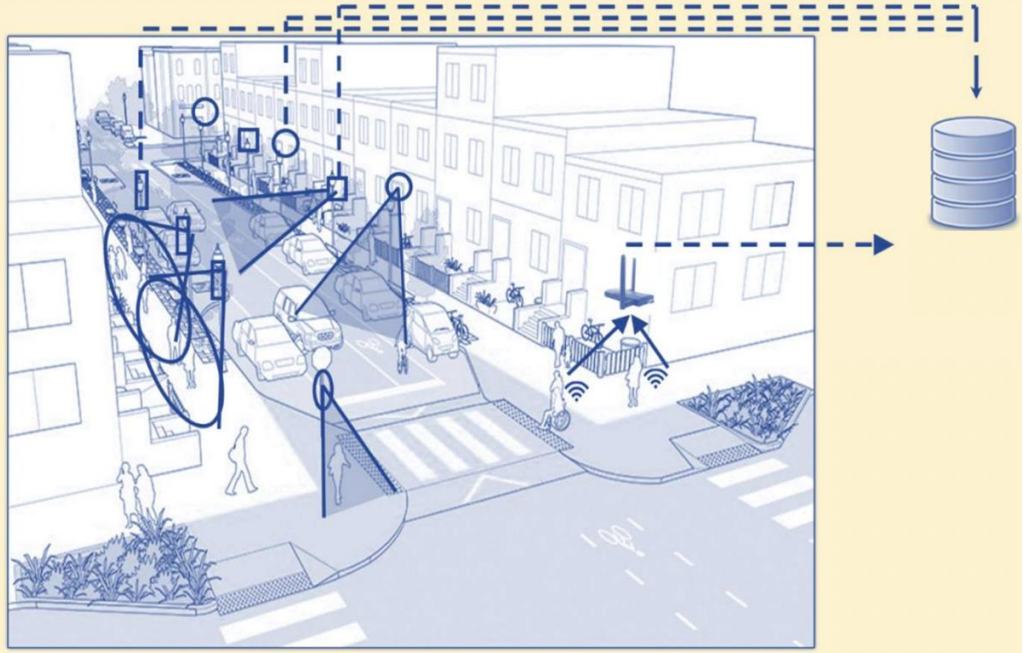
Uses generative AI to develop and test sustainable urban design prototypes.

Generative AI

Cities

Portland Urban Data Lake

Uses generative AI to analyze and manage data related to energy consumption, transportation, and waste management.



Urban data storage system
Public-private partnership
Address public's concerns

Generative AI

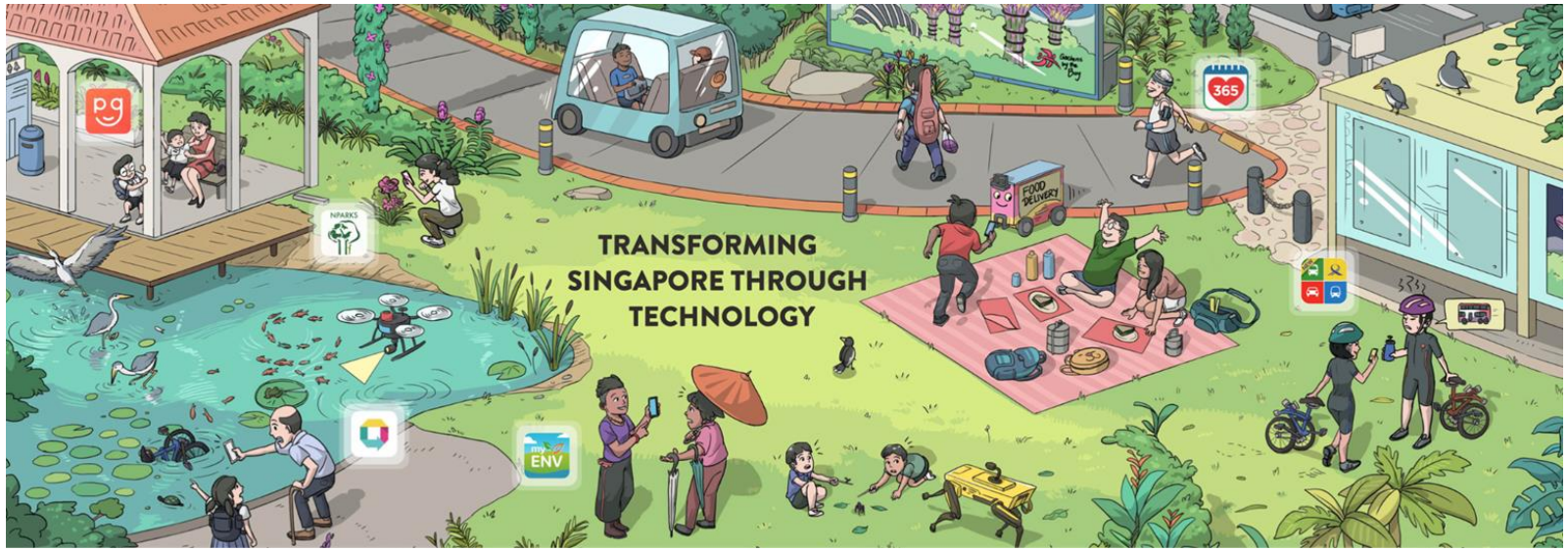
Cities

Smart Nation Singapure

Use of generative AI to optimize energy consumption, improve transportation systems, and manage waste.

Smart Nation SINGAPORE

https://www.smartnation.gov.sg/



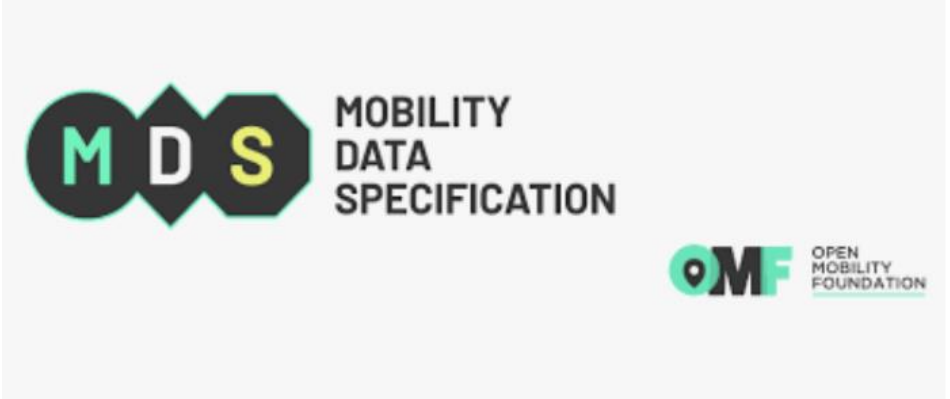
Generative AI

Cities

Los Angeles MDS

Uses generative AI to optimize the management of dockless e-scooters and bicycles, which have become increasingly popular modes of transportation in many cities.

The platform enables the city to collect real-time data about the location, usage, and charging status of these vehicles, and use this data to manage the fleet more efficiently and effectively.



https://cities-today.com/how-los-angeles-took-control-of-its-mobility-data/

Generative AI can help cities optimize their transportation systems, reduce congestion, and improve mobility for residents and visitors.

Must read books on sustainability

See list of twenty books on https://zerowastememoirs.com/baby-step-10-book-sustainability

Inspirations

Overview of 73 research reports on trends for 2022. A must read

Trends for 2022 from other sources: What's next: trends in innovation and technology; 12 exciting engineering milestones to look for in 2022; Tech questions for 2022; 22 predictions for 2022; 10 forecasts for the near future of Tech, by Adobe's Scott Belsky

The Future 100: 2022. Wunderman Thompson forecast of 100 trends to watch in 2022