

Transform! Designing the Future of Energy



Exhibition Concept

**Vitra
Design
Museum**



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The Exhibition

Energy is one of the forces that keep our society going; energy is political; energy is invisible.

The buildings, infrastructures, and devices for generating, distributing, and using energy are products of design, however, and design has a central role to play in the urgently needed transformation of the energy system. The exhibition »Transform! Designing the Future of Energy« explores the ongoing energy transition from a design perspective: from devices for harvesting renewable energy to solar buildings and wind turbines, from smart mobility to self-sufficient cities. The exhibition probes into the global thirst for energy and examines how design can assist us in switching to renewable energies and reducing our energy consumption. What action do industry and politics need to take, what can each individual contribute to a successful energy transition?

The exhibition »Transform! Designing the Future of Energy« will consist of four sections. Moving from small to large, it begins with the human body and how we position ourselves within the contested terrain of energy politics. From the next section, which presents an overview of everyday energy tools, it goes on to look at construction and mobility. The exhibition is rounded off by a final section addressing the energy dimension of urban and infrastructural planning. Displays will feature innovative product design, graphic design, and speculative design as well as architectural prototypes, scale models, and films made specially for the exhibition. A historical perspective is provided by a number of case studies tracing the relationship between design and the energy sector throughout the twentieth century.

COVER:
Marjan van Aubel, Ra, solar tapestry, 2022

PREVIOUS PAGE:
Léon Félix, Helios, foldable solar cooker, 2023

OPPOSITE PAGE:
Jule Bols and Sophia Götz, Pneuma, wind turbine
and greenhouse, part of U.F.O.G.O project at ECAL /
University of Art and Design, 2023

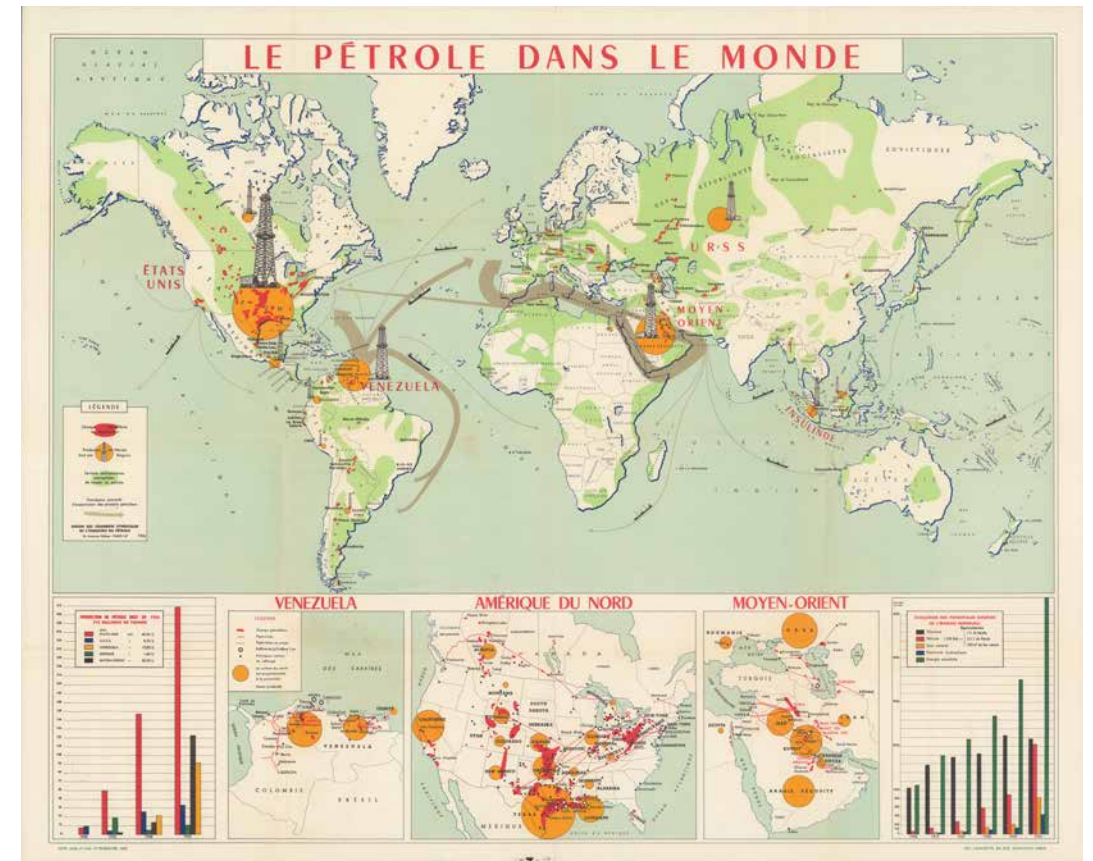
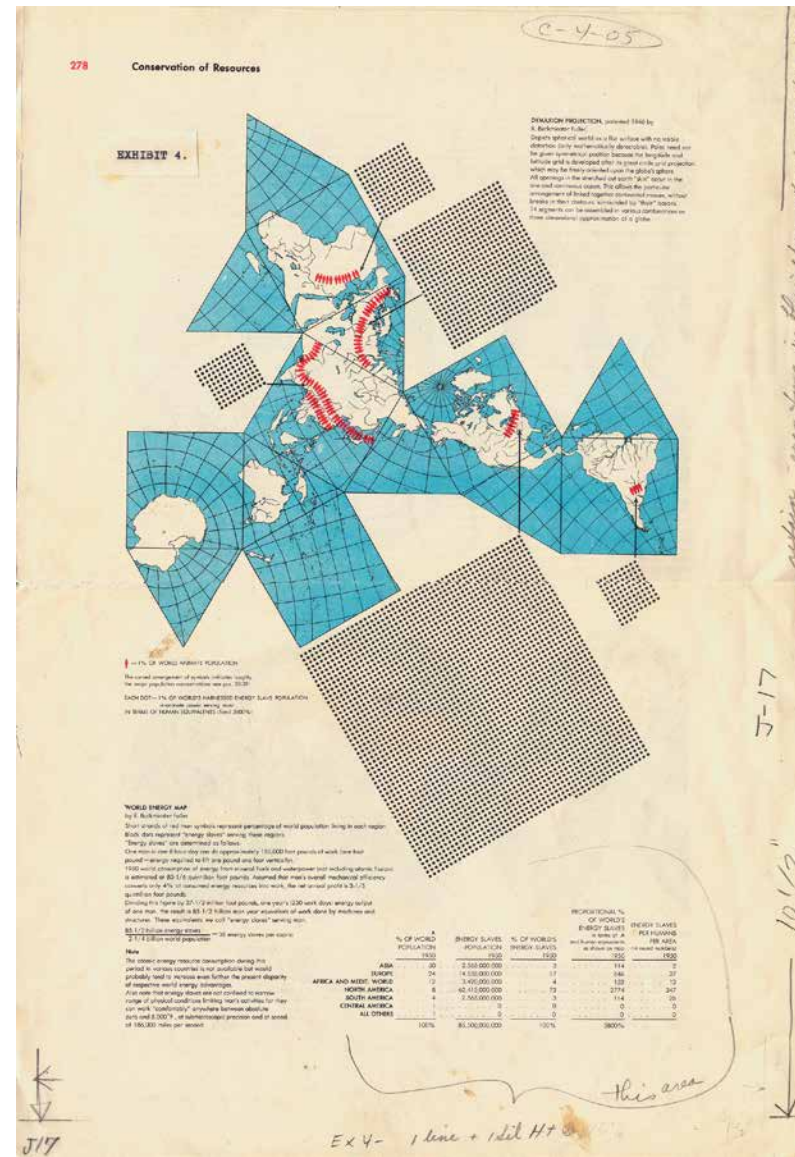


Human Power

At the start of the exhibition, an interactive installation will invite visitors to discover their own power. Pedalling away on exercise bikes that transform human energy into electricity, they will be able to compare their energy potential with the amount of energy needed in daily routines such as taking a shower, making coffee, or surfing the internet. This human power installation relates back to research made by R. Buckminster Fuller in the early 1940s. Experimenting with concepts like world energy and what he termed »energy slaves«, Fuller used maps to illustrate the huge variations in energy consumption across the globe and to compare the energy that humans are able to generate with the energy they consume.

The costs of energy – from both fossil and renewable sources – are all too often externalised, making the energy sector a much-contested and politically charged terrain. Placards and protest signs, handbills and flyers from different countries and periods reflect the development of energy politics: from the Atoms for Peace programme launched by US President Eisenhower to the first anti-nuclear-power protests, from the promotion of wind and solar energy to civil resistance against solar power plants and wind farms – from environmental activism to NIMBY (Not In My Backyard) culture.

All forms of energy generation, distribution, and storage have a spatial footprint: they require buildings and construction. A number of architectural models and a slide show created specially for the exhibition will illustrate how the resulting typologies have shaped – and will continue to shape – our landscapes. The »Petroleumscape« (to use a term coined by Carola Hein) embodies our dependency on a type of fuel from which we need to break free.



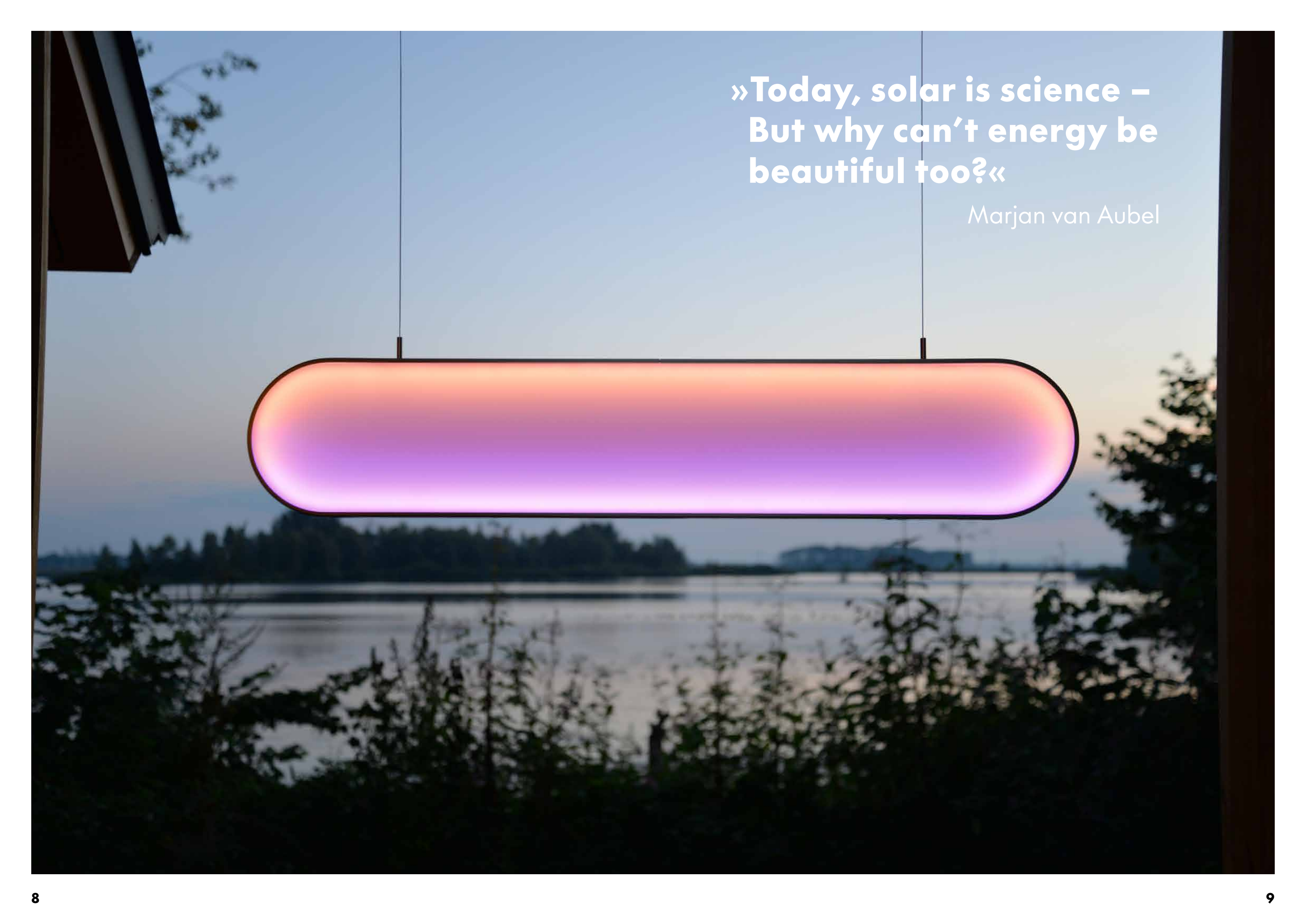
ABOVE:
Energy, Re:Gen, electricity-generating fitness bike, 2023

OPPOSITE PAGE, CLOCKWISE:
Buckminster Fuller, »Conservation of Resources,« reproduced in the World Geo-graphic Atlas published by Herbert Bayer and Container Corporation of America, 1953

»Fukushima mahnt: Alle AKWs abschalten!« (Fukushima warns: Shut down all nuclear power plants), poster, March 2011

»Le Petrole dans le monde«, map published by Union Des Chambres Syndicales De L'Industrie Du Pétrole, 1956

Nikolay Silaev, Atom v mirnykh celjach! (Atoms for peaceful purposes), Poster, 1960



»Today, solar is science –
But why can't energy be
beautiful too?«

Marjan van Aubel



Room 2

Energy Tools

Advances in photovoltaics, turbine technology, and biogas production today make it possible to use renewable energy efficiently even on a small scale. While some of the new tools were inspired by the »off-grid« lifestyle embraced by many people around the world, others were developed for communities without access to the grid. The second section of the exhibition introduces off-grid options for harvesting renewable energy in and around the home. These include products at the experimental stage, prototypes, serial products, and a number of speculative design projects. Marjan van Aubel's Sunne represents a new breed of sun-powered lighting design. Pauline van Dongen's creations harvest solar energy by means of textiles with integrated photovoltaics; the 25+ curtains developed by Esmée Willemsen & Anna Koppmann store heat by means of a phase-change materials printed on the fabric. To replace open fires in off-grid communities, Stefan Troendle has designed a cooker fuelled by green hydrogen. O-Innovations are working on prototypes for omni-directional wind turbines making the most of wind energy in windy cities. The archetypal artefacts designed by Pablo Bras offer a contemplation on the little flows of energy that always eddy around us, such as flowing water or gusts of wind. The Solar Protocol by Tega Brain, Alex Nathanson, and Benedetta Piantella explores what it would mean for something as ubiquitous and omnipresent as the internet to depend on solar energy and its natural cycles.

The exhibition also features solar-powered objects from the 1950s, when solar energy was first discussed as an alternative to fossil fuels. It was during this period that the Bell company launched the first photovoltaic cell, architects began to develop solar houses, product designers fitted electronic devices with photovoltaic cells, and Charles and Ray Eames created the Solar Do-Nothing Machine as a playful visualisation of how solar energy makes things move.



PREVIOUS PAGE:
Marjan van Aubel, Sunne, solar powered lamp,
2022

ABOVE:
Ville Kokkonen, Solar Parasol, 2018

OPPOSITE PAGE, CLOCKWISE:
Aurea Technologies, Shine Turbine, portable
wind turbine, 2023

Pauline van Dongen, Solar Shirt, 2014

Charles and Ray Eames,
Solar Do Nothing Machine, 1957

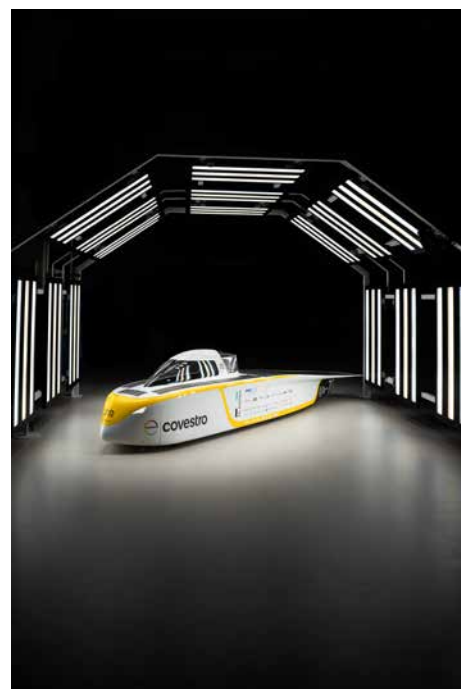
Esmée Willemsen, Anna Koppmann,
Plus Minus 25°C, thermal regulating curtains, 2020

Transformers

The building and construction sector accounts for around 36 percent of global energy consumption, and the transport sector's share is nearly as high. The exhibition's third part presents innovative solutions for reducing energy demand in both sectors.

Among the building projects featured is Snohetta's Powerhouse Brattørkaia in Trondheim. The building combines photovoltaics with the use of sea water for heating and cooling; its concrete elements serve as a kind of battery for storing heat and cold. Powerhouse Brattørkaia produces more than twice as much energy as it consumes, feeding the surplus into a local microgrid. The Day After House by TAKK architecture demonstrates that improving the energy balance of existing structures does not necessarily require high-tech. The retrofit is based on a wooden box-in-box concept making use of natural insulation materials and cross-ventilation, creating an apartment with different thermal zones that need little to no heating.

While the energy transition may be expected to involve a switch to electric automobiles, this is only a small part of the changes in mobility we will see in the future. Projects presented in the exhibition include an experimental lightweight solar car by Team Sonnenwagen and Ono Motion's Cargo E-Bike, which was designed to replace diesel-powered vehicles in courier and parcel services. A film commissioned from the Offenbach University of Art and Design will illustrate how improved intramodality – enabling seamless transfers between different modes of public transport, car sharing services, and micro mobility – may help reduce private transport and the energy use that comes with it. At sea, companies like Oceanbird are returning to wind power by introducing cargo ships with extractable sails. Meanwhile, TOWT and Ecoclipper have begun to offer cargo shipments on vessels powered by wind alone, harking back to the Age of Sail.



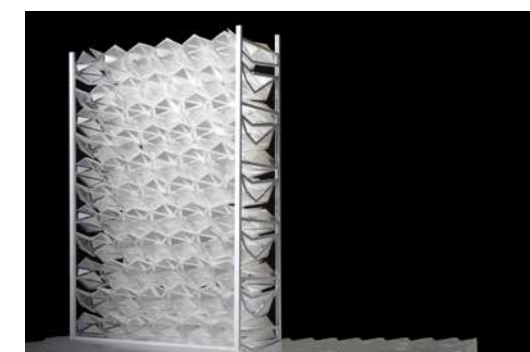
ABOVE:
Team Sonnenwagen Aachen, Covestro Sonnenwagen,
solar powered race car, 2019

OPPOSITE PAGE, CLOCKWISE:
TAKK // mireia luzárraga + alejandro muiño,
The Day After House, 2021

Ben Berwick, Solgami, solar screen, 2019

Onomotion, Ono Pioneers Edition, E-Cargobike,
2020

CF Møller Architects, Copenhagen International School,
Copenhagen, 2013–2017



»SolarVille aims to showcase that, when combined, technologies such as solar panels, micro-grids and blockchain open new opportunities for [...] people to leapfrog traditional grid electricity.«

Space 10



Future Energyscapes

The efficient use of renewable energies will require new and different distribution networks. The fourth section of the exhibition addresses the opportunities offered by the energy transition for redefining and decentralising energy production and use. Renewable energy can be generated where it is used, obviating the need to ship and distribute fuels across long distances. Space Ten's Solarville envisions a town powered by solar energy where production, distribution, and consumption are steered by blockchain management. ECAL's U.F.O.G.O project is a compelling case study on how to increase the acceptance of local windfarms by designing site-specific wind turbines.

The transition to renewable energies that depend on natural cycles will also require new structures for regional and local energy storage. Carlo Ratti's Hot Heart concept for Helsinki proposes a series of islands to be moored off the Finnish capital's coast with the dual function of storing thermal energy and serving as a hub for recreational activities. A film commissioned from Transsolar and Urban Catalyst will visualise why energy needs to become an integrated layer of urban planning. And what do we do with the obsolete infrastructures of the fossil age? Honglin Li and XTU Architects propose turning offshore oil platforms into holiday resorts or ocean plastic waste incineration plants.

The exhibition also looks back at historical visions of renewable energy networks, from Atlantropa to to OMA's Eneropa study, juxtaposing them with present-day conceptions like the European Space Agency's plans for harvesting solar energy in space or the Solarpunk movement dreaming of new, green cityscapes in tune with nature and powered by the sun. The exhibition will show that designing the transformation of the energy system means far more than new ways of harvesting renewable energies and making better use of existing resources and structures. It means altering the pace at which our societies function, moderating the need for energy and, in other words, redesigning the way we live.



PREVIOUS PAGE:
Space 10, Solarville, miniature neighbourhood (1:50 scale) powered by solar energy, 2019

ABOVE:
Leon Tukker, Atomhawk Solarpunk challenge – Nova Nakhon Sawang

OPPOSITE PAGE, CLOCKWISE:
XTU Architects, X_Land, rendering, 2020

Lava, Energie- und Zukunftsspeicher [Energy Storage Facility] Heidelberg, 2016-24
Carlo Ratti, Hot Heart, thermal energy storage, vision for Helsinki 2030

European Space Agency, Solaris, space based solar power, rendering, 2022



Facts

Exhibition floor space

600 – 1,000 m² / 6,000 – 10,000 sq ft

Exhibits

Design objects, models, posters, film, photography, and prototypes

Curator

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Exhibition Tour

Following the presentations at the Vitra Design Museum the exhibition will be available to international venues from fall 2024 onwards.

Dates

Vitra Design Museum, Weil am Rhein

23 March 2024 – 1 September 2024

Publication

The exhibition is accompanied by an extensive book published by the Vitra Design Museum.



IMPRINT/CREDITS

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Opposite page: Christa Carstensen, Harvest / Solar, solar-powered table lamp, 2023

Back Cover: Philips Design Probe, Microbial Home, Bio-Digester Island, 2011

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