

the first energy landscape reader for students

a guide to online sources on climate and energy transition, renewable energy technologies, energy landscapes and beyond

version

1.1

June

2021



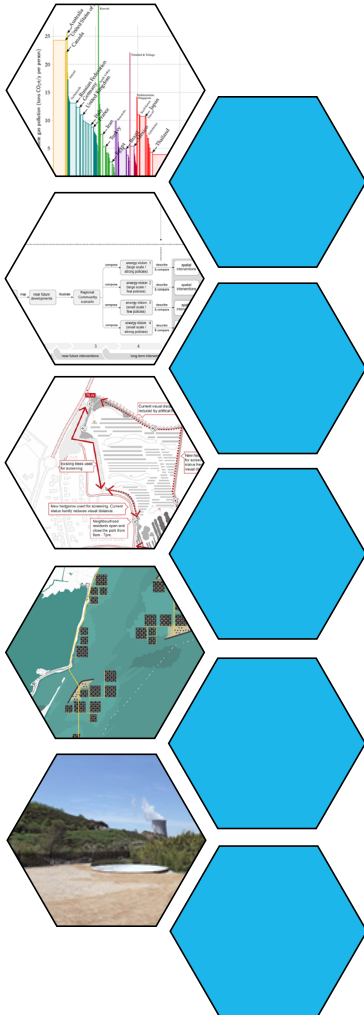
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High Density Energy Landscapes Research Group

Home

Dear student, this reader collects a series of sources and publications on the topic of energy transition. The reader is an interactive pdf and contains meta-links through which you can have a direct access to the listed sources. You just need to click on source button to be directed to the web article, post or downloadable pdf. The reader is published and updated and regularly updated by the High Density Energy Landscape Research Group and it is intended as an easy tool for students that would like to get knowledge on the topic and be inspired by existing design research and realized projects. It is divided in five main parts as you can discover in the table of content below.

In the cover *Georgswerder Energy Hill* , Hamburg, Germany, by Häfner/Jiménez Büro für Landschaftsarchitektur (2013) (photo credit Hanns Joosten on Landezine.com)



CLIMATIC AND ENERGY DATA

Click here to gain some knowledge on the numbers of climate change, *decarbonization* and energy transition spatial dimension and targets.

ENERGY LANDSCAPES THEORIES

Click here to gain knowledge on the energy landscape concept and theories, and the energy transition as a driver of landscape change

DESIGN APPROACHES AND METHODS

Click here to gain knowledge on approaches and methods to plan and design energy landscapes linking regional and local scales.

DESIGN RESEARCH AND NOT YET REALIZED PROJECTS

Click here to be inspired by innovative energy landscape design research and not yet realized projects.

INSPIRING REALIZED PROJECTS

Click here to be inspired by existing energy landscape realized projects.

1.0 climatic and energy data

Sustainability Without the Hot Air | "Twaddle emissions are high at the moment because people get emotional (for example about wind farms or nuclear power) and no-one talks about numbers. Or if they do mention numbers, they select them to sound big, to make an impression, and to score points in arguments, rather than to aid thoughtful discussion. This is a straight-talking book about the numbers. The aim is to guide the reader around the claptrap to actions that really make a difference and to policies that add up." This is book to start orienting yourself in a carbon free world, some data can be a bit outdated, but it doesn't matter.

book

Climate Energy and Space | "How big is the task of the climate and energy transition? What is the spatial impact of it and what design options are there to meet this enormous challenge? The book brings together leaders in the field of energy and space. The Book was commissioned by the ministries of Economic Affairs, Infrastructure & Water Management and Internal Affairs".

book

Dutch only

Energy & Space - a national perspective | "How much space does the sustainable generation of our energy require in the Netherlands? And what does this mean for our cities and our landscape? This publication outlines possible answers and shows which choices lie ahead. An important task, because in Paris 2015 The Netherlands agreed that will reduce CO2 emissions b 80-95% in 2050. In light of the Paris 2015 agreements research teams and offices for a long time involved into the connection between energy and space joint forces for a perspective in 2050"

book

Dutch only

C4/C6 2020 lectures series at AvB 08|04|2020 <GETTING STARTED>
Ingrid Luijckx (Wageningen University) #climate change and carbon budgets
Dan van der Horst (University of Edinburgh) #landscapes of less than two percent degrees global warming

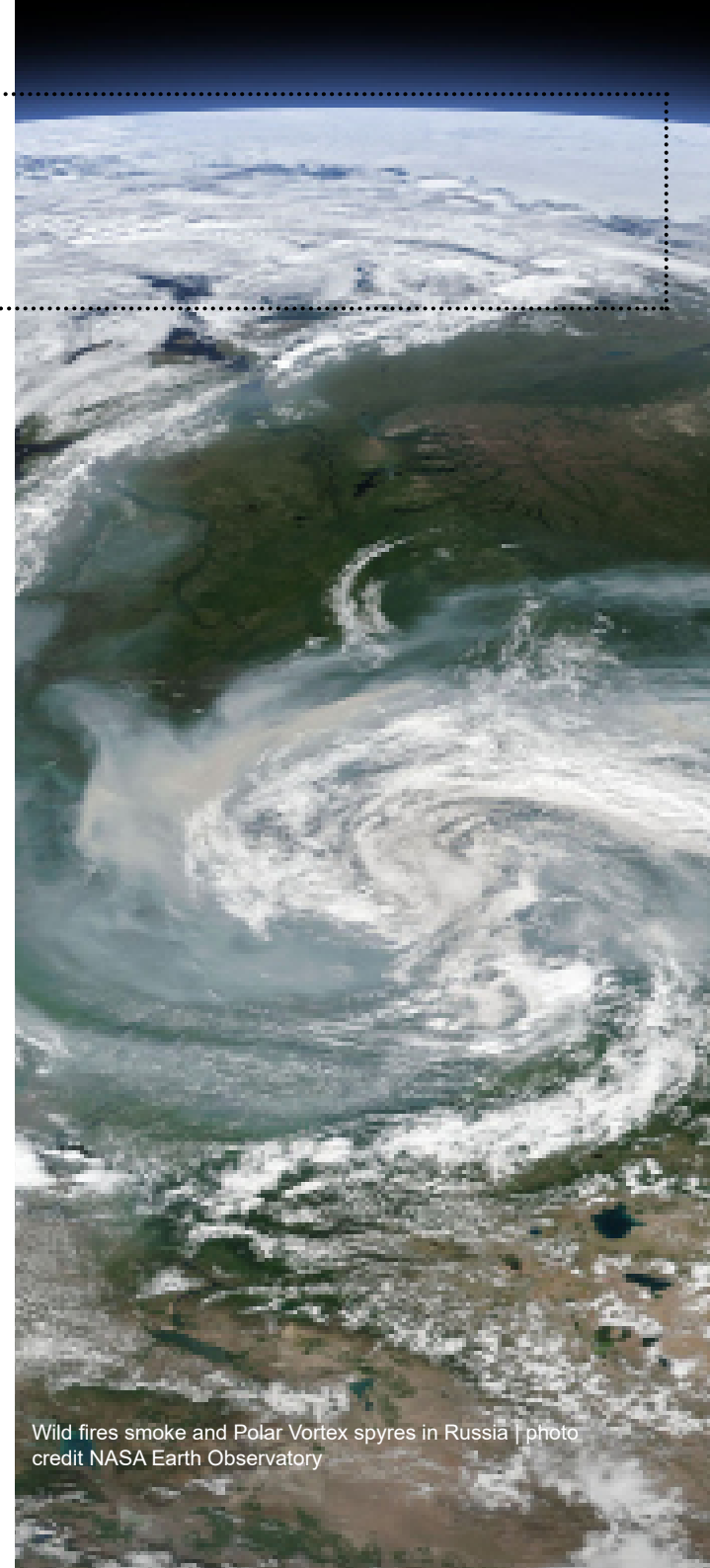
lecture

The Geopolitics of the Global Energy Transition | "Every great transition in energy technology entails a shift in geopolitics as well. Our generation's energy transition to zero-carbon energy, or decarbonization, will reshape geopolitics of the twenty-first century. This superb volume offers a deep informed tour d'horizon of the geopolitics of global energy decarbonization, and the ways that geopolitics may stymie or support the transition to climate safety.

book

A field guide to renewable energy technologies | "Land Art Generator field guide to renewable energy technologies second edition. "We have put together this guide to renewable energy technologies as a useful resource for all designers [...] We hope that you will use this guide with every project you work on. There is more out there than what we see in the everyday. In fact, you will see in this guide that there are dozens of proven methods of harnessing the power of nature in sustainable ways."

guide booklet



Wild fires smoke and Polar Vortex spires in Russia | photo credit NASA Earth Observatory

2.0 energy landscapes theories

Local Rights to Landscape in the Global Moral Economy of Carbon | “Energy policy is an increasingly influential driver for landscape change in the Global North and in rapidly industrializing nations. The renewable energy industry and the large utilities installing wind farms are increasingly powerful actors in the global economy, and their activities are giving rise to a growing number of energy-landscape conflicts. Dependent on its characteristics with regards to the local landscape and the energy system it is part of, a renewable energy project can be portrayed as representing either development or conservation, and representing either globalization or localization”.

paper

Learning to Love the Landscapes of Carbon-Neutrality | “This essay proposes that society’s increasingly earnest pursuit of sustainable development will involve landscape changes that attract protest and opposition, and which may prove a barrier to the rapid adjustments necessary to substantially reduce our carbon footprint. It considers this possibility by exploring two aspects. First, it considers the role of ‘drivers’ of change, and suggests that significant loss of traditional landscapes is inevitable, as the drivers that produced them are often becoming obsolete. Energy is likely to be a major driver of new landscapes as society seeks ways of weaning itself off fossil carbon fuels”.

paper

Energy landscapes in a crowded world: A first typology of origins and expressions | “One of the main drivers of landscape transformation has been our demand for energy. We refer to the results of such transformations as “energy landscapes”. This paper examines the definition of energy landscapes within a conceptual framework, proposes a classification of energy landscapes, and describes the key characteristics of energy landscapes that help to define an over-arching typology of origins and expressions. Our purpose is to inform scholarly discourse and practice with regard to energy policies, decision-making processes, legal frameworks and environmental designs”.

paper

Evolution of Energy Landscapes: A Regional Case Study in the Western Netherlands | “While the transition to renewable energy becomes a main driver of landscape change, few publications discuss the historical transformation of landscapes for the development of energy—commonly referred to as energy landscape. The research reported in this paper investigates the evolution of energy landscapes in the Western Netherlands—a region shaped by peat extraction and dotted with wind-mills. Five periods have been identified, dominated by wood, peat, wind, fossil fuels, and modern renewables, respectively. During each period, the landscape coevolved with the new energy source hosting new energy infrastructure.”

paper

Practices in transition: A comparison of how Dutch and French landscape architects contribute to energy transition | “The transition to renewable energy has started to affect landscapes in many countries, raising the interest of many disciplines. This research examines the involvement and contribution of landscape architects to energy-related projects. It compares the situation in The Netherlands with that in France making use of an online questionnaire. Results show that two thirds of the practitioners in both countries have been working on energy-related projects”

paper

Zon in landschap - Talkshow deel 2: Ruimtelijke kwaliteit | Sven Stremke is one of the interlocutors of this talk-show reflecting on the development of PV parks and landscape quality in The Netherlands.

talk-show
Dutch
only



Cattle and solar trackers in Moñreale, Sicily, Italy | photo credit Dirk Oudes - HDEL

3.0 design approaches and methods

Energy Potential Mapping for Energy-Producing Neighborhoods | "Over the past five years, the method of energy potential mapping (EPM) has evolved from a *cartoonish* charting of climatic features with energy consequences to a detailed methodology for the development of spatial plans based on energy-effective foundations. By means of EPM the rudimentary features and properties of an area are analyzed, made discrete and translated into maps of the specific area (be it a region, city, district or neighbourhood) depicting potentials for energy supply and generation."

paper

Integrated Visions (Part I): Methodological Framework for Long-term Regional Design | "The growing complexity of regional planning and design, in combination with increasing concerns about climate change and resource depletion, has revived the discussion on strategic thinking. Spatial planning and landscape architecture develop long-term visions to facilitate the gradual adaptation of the physical environment [...] This paper focuses on the emerging methodological framework for long-term regional design, and argues that three modes of change should be integrated into the design process: change due to current projected trends, change due to critical uncertainties and intended change. Subsequently, a five-step approach to the development of long-term visions is derived and illustrated in this paper".

paper

Integrated Visions (Part II): Envisioning Sustainable Energy Landscapes | "The first paper of this two-part series discussed several existing approaches to long-term regional planning and landscape design, and presented an alternative, five-step approach for the composition of integrated visions [Stremke, S., Kann, F. Van & Koh, J. (2012) Integrated Visions (part I): Methodological Framework, *European Planning Studies*, [20(2), pp. 305–320]. This paper illustrates how the five-step approach was employed to compose a set of integrated visions for the development of sustainable energy landscapes in south of the Netherlands".

paper

Spatial transition analysis: Spatially explicit and evidence-based targets for sustainable energy transition at the local and regional scale | "In the Netherlands and other countries, more densely populated regions have drawn up ambitious targets for energy transition. Most of these transition targets lack empirical evidence with regard to spatio-technological feasibility. This lack of evidence may compromise energy transition if constraints are discovered posteriori and short-term milestones missed. To address this shortcoming, we propose an integrated approach. "

paper

Advancing the relationship between renewable energy and ecosystem services for landscape planning and design: A literature review | "The transition to a low carbon future is starting to affect landscapes around the world. In order for this landscape transformation to be sustainable, renewable energy technologies should not cause critical trade-offs between the provision of energy and that of other ecosystem services such as food production. This literature review advances the body of knowledge on sustainable energy transition with special focus on ecosystem services-based approaches and methods".

paper

Deploying ecosystem services to develop sustainable energy landscapes: a case study from the Netherlands | "The transition to a low carbon future is an emerging challenge and requires the planning and designing of sustainable energy landscapes - landscapes that provide renewable energy while safeguarding the supply of other ecosystem services. The aim of this paper is to present the application of an ecosystem services trade-off assessment in the development of sustainable energy landscapes for long-term strategic planning in a case study in Schouwen-Duiveland, The Netherlands. "

paper

Linking research through design and adult learning programs for urban agendas: a perspective essay | "Local governments are addressing energy transition, one of the prominent sustainability goals in the urban agendas, yet they need to enhance capacity building, therefore engagement with sustainability science and adult learning programs for civil servants are frequently activated. Landscape architects are more frequently called to be boundary spanners in complex sustainability goals. This perspective essay investigates the synergetic links between adult learning approaches and landscape architecture research through design in the prominent field of the transition to

paper

Research through design for energy transition: two case studies in Germany and The Netherlands | "The purpose of this paper is to enlarge the body of knowledge on research through design (RTD) methods that can be employed by landscape architects and others working on (but not limited to) sustainable energy transition. A specific approach to RTD – qualitative landscape structure analysis (QLSA) – is introduced and illustrated by means of diagrams and photographs. Two case studies showcase the application of QLSA for research on solar parks in the Netherlands and research on wind turbines in the Alpine foothills in Southern Germany. The case studies show how RTD can help to define design principles for large solar parks and arrangement of wind turbines in particular landscape types in the Netherlands and Germany, respectively".

paper



Solar energy potential map of Parkstad Limburg | image credit Oudes and Stremke, 2018, p. 6

10 km

4.0 design research and not yet realized projects

Incorporating Renewable Energy Science in Regional Landscape Design: Results from a Competition in The Netherlands | "Energy transition is expected to make an important contribution to sustainable development. Although it is argued that landscape design could foster energy transition, there is scant empirical research on how practitioners approach this new challenge. The research question central to this study is: To what extent and how is renewable energy science incorporated in regional landscape design"?

Next generation solar power plants? A comparative analysis of frontrunner solar landscapes in Europe | "Solar power plants transform the existing landscape. This landscape change raises concerns about visual impact, land use competition and the end-of-life stage of solar power plants. Existing research stresses the need to address these concerns, arguing for a combined spatial arrangement of solar power plant and landscape: solar landscape. Solar landscapes share the aim to achieve other benefits (e.g. reducing visibility, habitat creation) in addition to electricity generation, yet empirical evidence on solar landscapes is scarce. This comparative analysis of 11 frontrunner cases aims to contribute to the understanding of solar landscapes, by studying the spatial properties visibility, multifunctionality and temporality".

C4/C6 2020 lecture at AvB 06|05|2020 <CONVERGING TRANSITIONS>

Klaas Jan Wardenaar (SmartLAND) #Climate-responsive design practice
Dirk Sijmons (HNS, ex state advisor landscape) #Energy and agriculture in the Netherlands

C4/C6 2020 lecture at AvB 22|04|2020 <TAKING STOCK>

Dirk Oudes (AvB, WUR) #Best practice built solar landscapes
Hester Koelman and Lieke de Jong (AvB) #Award winning student designs

C4/C6 2020 lecture at AvB 13|05|2020 <PERSPECTIVES>

Alessandra Scognamiglio (ENEA, Italy) #Designing solar landscapes in the Anthropocene
Elizabeth Monoian and Robert Ferry (LAGI, Land Art Generator Initiative) #Art and energy in the Anthropocene

LAND ART GENERATOR INITIATIVE

"The goal of the Land Art Generator is to accelerate the transition to post-carbon economies by providing models of renewable energy infrastructure that add value to public space, inspire, and educate—while providing equitable power to homes around the world".

Wind Energy and spatial quality, The Netherlands | H+N+S

"At the end of 2011 the Structural vision Wind Plan Wieringermeer was established. The plan formulates a strong ambition with regard to spatial quality: 'more wind energy in a more attractive landscape'. H+N+S developed a plan which can be used to evaluate and guarantee the spatial quality".

Ecological Energy Network, The Netherlands | FABRICations

"In the Netherlands, the land in proximity to the high voltage grid is subject to considerable restrictions, especially in urban areas. Consequently, it may result in a neglected portion of the territory and a physical disruption of the urban fabric where no permanent program is allowed. FABRICations took advantage of this underused space to create a niche for biodiversity by creating green corridors in proximity of the high voltage: the Ecological Energy Network".

P5 Energize in Utrecht | Hester Koelman, Jeroen Muëller, Karolis Platakis, Lieke de Jong, Philippe Allignet, Stijn Dries, Veerle Hendriks, Wouter Grote (AvB)

"How can you generate 2 petajoules (PJ) of energy per year in the form of a large-scale and iconic landscape? Eight students from the Amsterdam Academy of Architecture started working on this design question in the autumn of 2018".

Landschapstriënnale tentoonstelling energielandschappen |

"Net als veel andere Europese landen moet Nederland de uitvoering van de energietransitie versnellen om de internationale afspraken na te komen. Binnen Europa is Nederland een van de landen met de hoogste bevolkingsdichtheid. De beperkte ruimte in ons land noodzaakt ons tot het vinden van integrale en multifunctionele oplossingen om tot een hernieuwbaar energiesysteem te komen.



LAGI Glasgow, The wind forest by Peter Foster Richardson (ZM Architecture), Matthew Dalziel and Louise Scullion (Dalziel + Scullion), Ian Nicoll (Qmulus Ltd.), Peter Yeadon (Yeadon Space Agency) | image credit LAGI 2015

paper
paper
lecture
lecture
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website
report
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posters
website

Dutch only
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5.0 inspiring realized projects

biomass

Dyck Castle, Germany | RMP Landschaftsarchitekten

"The Schlosspark, which has taken shape slowly over time, "meets" a modern landscape garden with Chinese silver grass – we have created a green space that is simultaneously respectful and innovative, one that points the way for the future [...] the use of Miscanthus is the core element of our aesthetic strategy. This grass variety is also a renewable energy source. Burned in a biomass power plant, the harvested grass supplies the energy needs of the Schloss complex for a whole year".

geothermal

Sasso Pisano Geothermal Complex, Italy | CZ Studio Daniela Moderini Giovanni Sellano

"According to the programs of EnelGreenPower, the aim of the project of restyling of the geothermal site of Sasso Pisano in Tuscany, is conjugate the protection of the natural landscape with the industrial production of renewable energy [...] The touristic path runs through the natural geothermal manifestations and introduces elements useful for their observation - along the way there are various belvedere and informative structures . On the top of the path, a wooden platform is a scenic viewpoint on the geothermal power plant and on the whole valley. An area for public events with visual relationship with the steam-tower, completes the project."

wind

Georgswerder Energy Hill, Germany | Häfner/Jimenez Landscape Architecture

"At the same time, the progressing urban development caused the inner city of Hamburg to move closer to the landfill hill. Therefore, it stood to reason that when the landfill is transformed into the Energy Hill, its green areas would become a convenient spot for local recreation. But the new landscaping plan was also supposed to make clear that the Energy Hill is a technical construction which requires ongoing control and treatment by the generations of our children, our children's children and beyond" .

solar

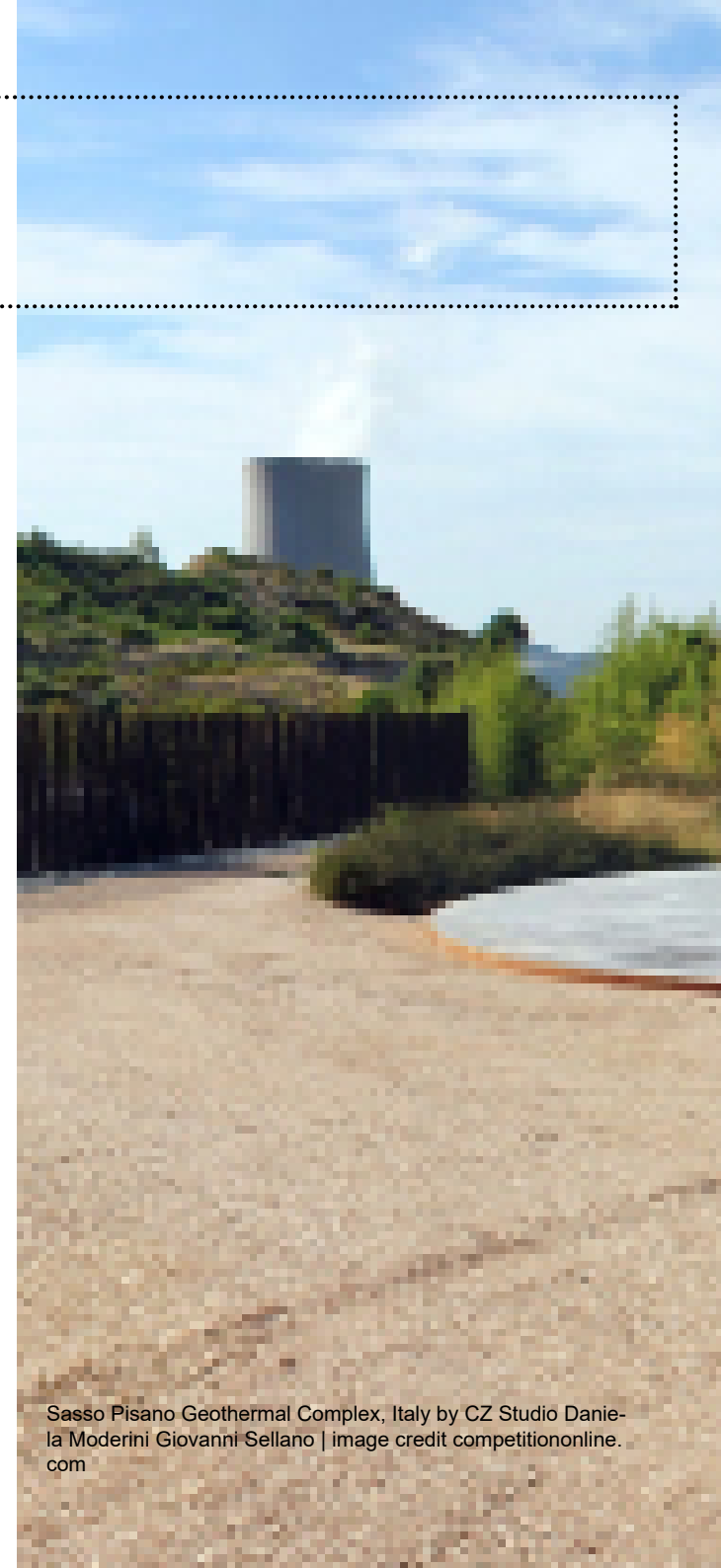
The Solar Strand at UB Campus, Buffalo University, USA | Walter Hood landscape architects.

"Together water and light merge, harnessing nature's energy from sunlight and hydrological infiltration. The project is the centerpiece in the hybrid landscape. Its form, figuratively a fingerprint, highlights the campus' goals and objectives for a sustainable future. A 5000 PV panel array is at once infrastructure (energy production), emergent landscape (hosting diverse array of flora and fauna), and classroom".

integrated renewable energy technologies

Longfor G-Park, Beijing, China | Instinct Fabrications

"A self-sustaining system is one in which the landscape can self-supply power and water for the operation and maintenance. The concept can be realised through solar thin film technology and water storage module devices. One solves the energy cycle and the other stores and reuses the stormwater, so both of which have become the heart of the park, promoting a self-sustainable low-carbon ecological cycle".



Sasso Pisano Geothermal Complex, Italy by CZ Studio Daniela Moderini Giovanni Sellano | image credit competitiononline.com

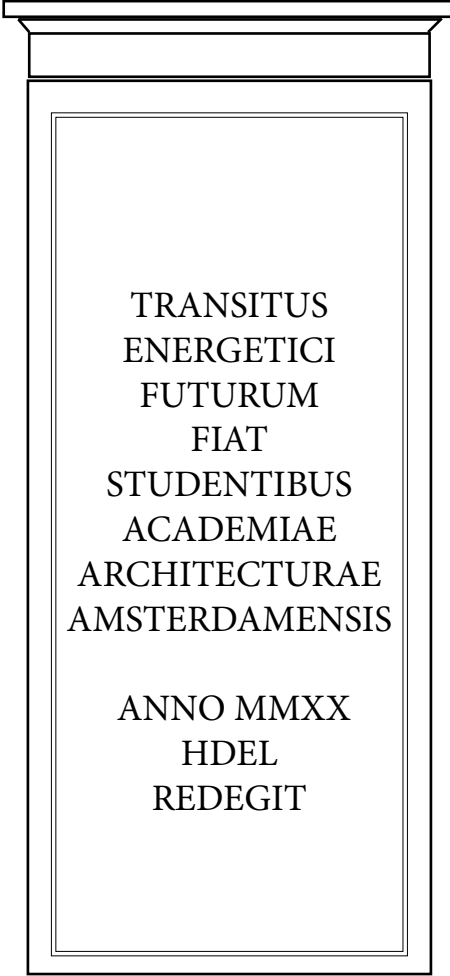
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TRANSITUS
ENERGETICI
FUTURUM
FIAT
STUDENTIBUS
ACADEMIAE
ARCHITECTURAE
AMSTERDAMENSIS

ANNO MMXX
HDEL
REDEGIT

*“The future of the energy transition be with
the students of the Amsterdam Academy of
Architecture*

The HDEL redacted in 2020.”