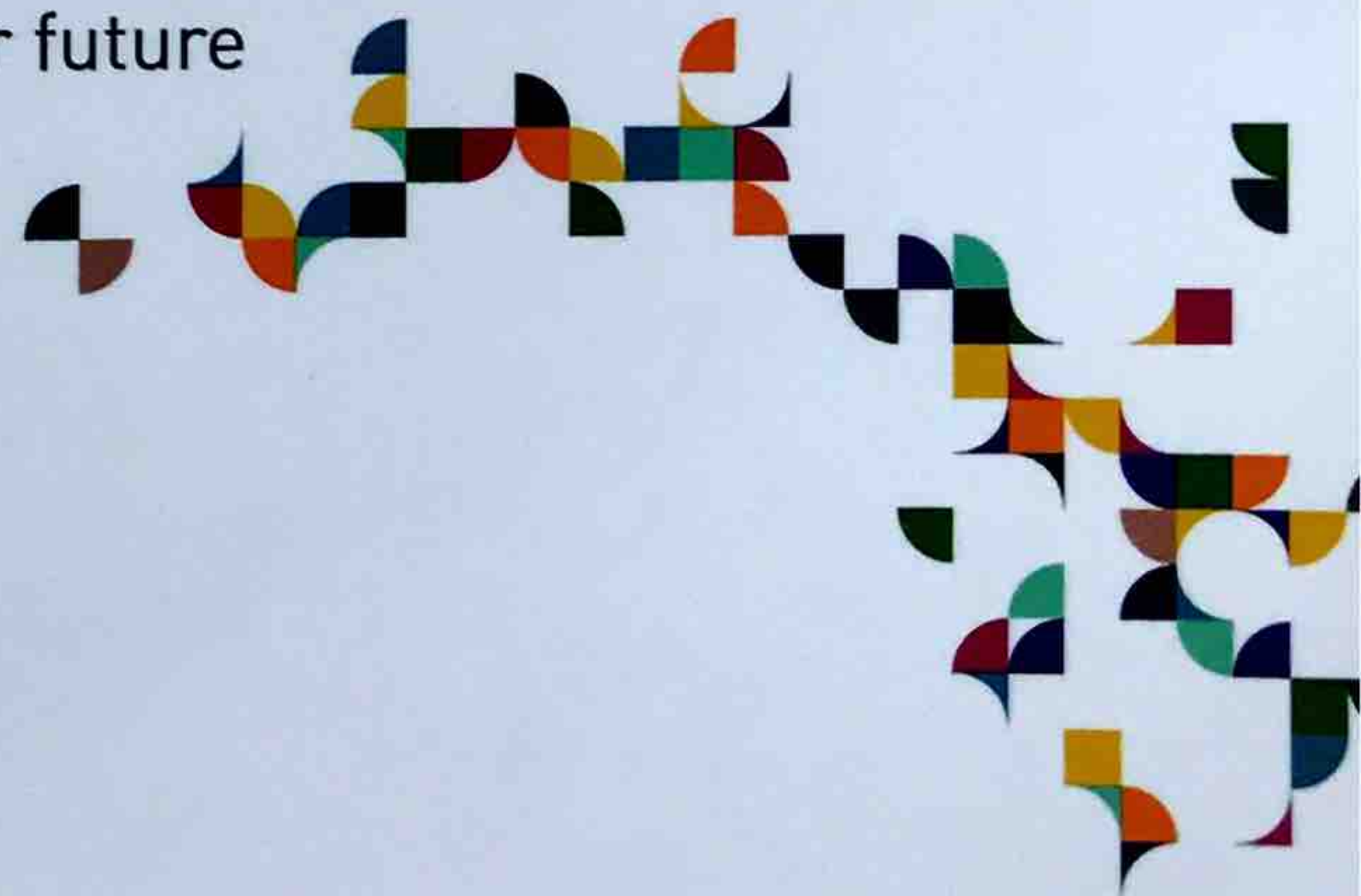
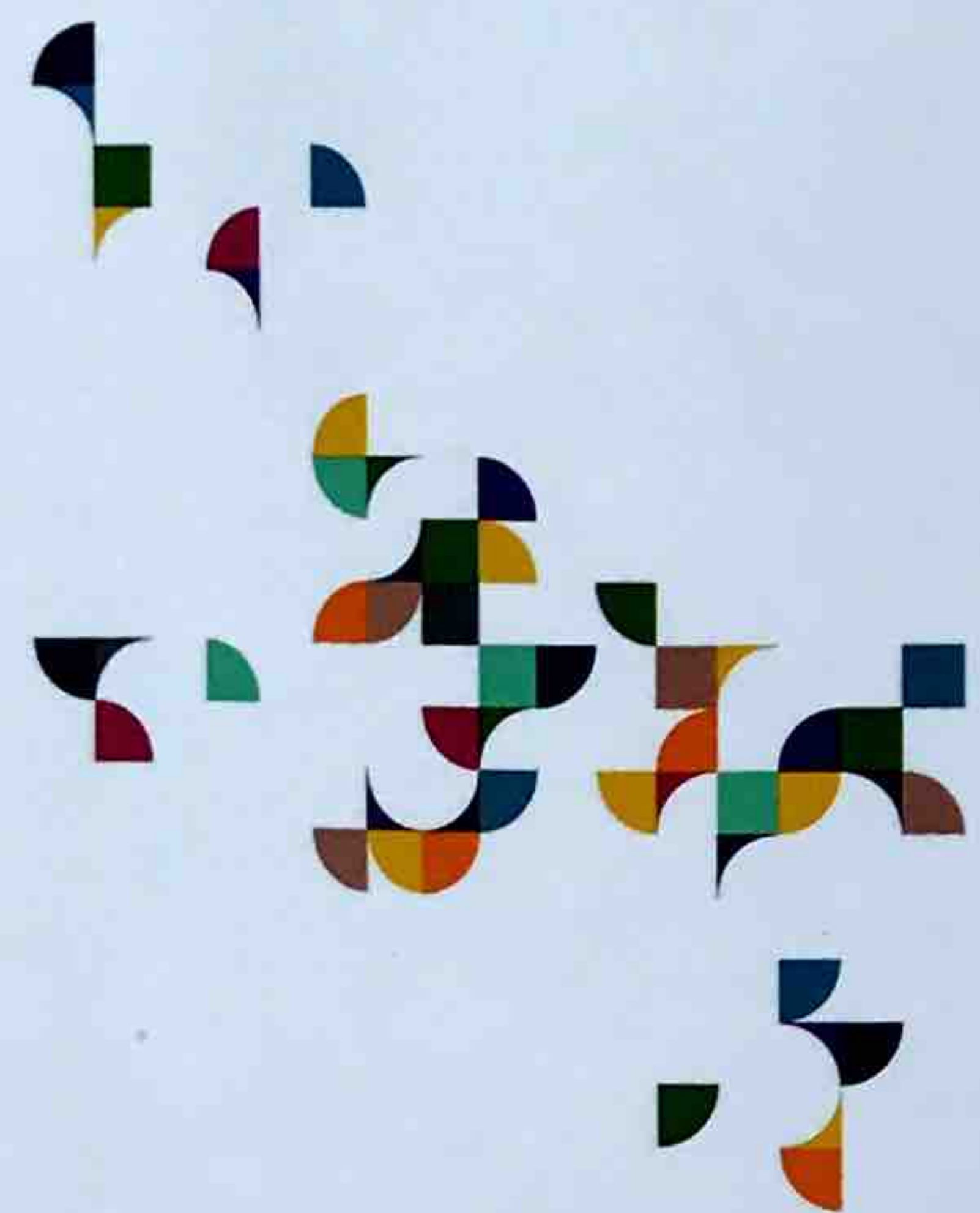


DECARB EUROPE

Connecting technologies for a cleaner future



The goal of DecarbEurope is to engage decision-makers in policy and industry with solutions that can, in a cost-effective manner, decarbonize Europe at the scale and speed that is needed to achieve our climate goals. As an ecosystem of 20 sectors—and growing—the initiative connects technologies, policies, and markets in a cross-sector roadmap towards a low-carbon economy. Partners of DecarbEurope commit themselves to the common values that are driving this transition: decarbonization, cost-effectiveness, circularity, sector-coupling, and consumer engagement.



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OPTIMIZING WIND POWER Faroe Islands

SEV, the Faroe Islands utility, has commissioned Europe's first fully commercial Li-ion energy storage system (ESS) operating in combination with a wind farm. Saft's 2.3 MW containerized solution is helping to maintain grid stability so that the islanders can capture the full potential of their 12 MW Húsahagi wind farm. The ESS provides ramp control to smooth out sharp increases and decreases in power, as well as frequency response and voltage control services. The ESS also minimizes curtailment during periods of high wind and low consumption, as excess wind energy that cannot be injected into the grid is stored in the batteries.



UCAPS FIRING' PV ENERGY USA

Ultracapacitor technology projects from Maxwell Technologies such as the "Palisade project" installed in early 2017 in California, enables the renewable power to be stabilized or to "firm" the output power. Therefore utilities will be able to reduce or delay building additional standby power or regulation generated from other sources.

With an optimum sizing of an ultracapacitor energy storage for solar smoothing a power rating of 20% or more of the PV rated power and a reserve capacity can be achieved, while the maximum discharge time under full load can be 100 seconds or more.



MILESTONE FOR HYDROPOWER Portugal

Portugal has been focusing for years on the flexible and dynamic potential of pumped storage to stabilize electricity grids. The new pumped storage plant Frades II has been in operation since 2017. Technology Group Voith supplied the plant with two variable speed pump turbines, two asynchronous motor-generators, the frequency converter and control systems as well as the hydraulic steel components. The key element of the plant is a special asynchronous

motor-generator that offers three advantages: 1) it can respond faster and more flexibly to the active and reactive demand from the power grid; 2) it provides additional stability in the event of a drop-in voltage; and 3) it enables a fast restart if a power outage occurs. Following the successful start-up, the biggest variable speed pumped storage plant in Europe is considered the flagship project for further plants worldwide.

(Left) Saft Li-ion energy storage enables SEV to optimize wind power for the Faroe Islands at Husahagi. Source: SEV
(Middle) Maxwell ultracapacitors with cell management and monitoring. Source: Maxwell Technologies
(Right) Pumped storage power plant Frades II, north-west of Portugal. Source: Technology Group Voith

