Sustainability 2021

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10B
People
75%
Urban dwellers
5B
Middle class
2X
Energy demand


Construction
5000
New buildings per day
1%
Average productivity growth
~50%
Of raw material consumption
~1/3
Of all solid waste


Cities
>2/3
Of all energy consumption
70%
Global CO2 emissions
90%
situated on coastlines
2X
Projected growth by 2050


Buildings
40%
global energy consumption
1/3
global GHGs
30%
is wasted
HVAC
is the main load

Business Drivers Align With Sustainability



Cost
Waste
Reduction

Compliance
Regulation and
standards

Brand
Authentic
Reputation

Concern
Impact

Customer Sustainability: Where to Start?

What does the customer say in public?

Why does it matter to the company?

Are there public examples or projects?

Is the Autodesk story/marketing relatable?

Are your contacts connected, concerned, impacted?

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A better world designed and made for all

FY21 IMPACT REPORT



Partner with customers

Design & Manufacturing

Approximately 19% of global greenhouse gas emissions are from the manufacturing industry,[15] and by 2050 the growth in population and associated demand for consumer goods will require at least twice the energy[16] and materials[17] currently used. These impacts and trends, combined with customer demand for more environmentally friendly products as well as new environmental regulations, are driving manufacturers to commit to sustainable and circular outcomes in their work. Manufacturing companies that address these opportunities could see potential revenue of $338 billion from new sustainable products and services in the short to medium term.[18]

To address sustainability challenges and meet their commitments, many Autodesk customers are implementing smarter and more efficient design and manufacturing approaches, increasing materials productivity, developing more circular business models, reducing energy use, and enhancing supply chain responsibility.

In 2020, we conducted a survey of designers, engineers, and procurement, operations, and production professionals in a range of design and manufacturing industries[19] in the United States to better understand the impact of sustainability issues in those areas.

30%
of respondents stated regulation and compliance as the most important motivation to reduce environmental impact; cost savings (24%) and competitive advantage/differentiation (21%) also rated high.

64%
of respondents stated that reducing material waste in production was the top environmental priority in decision making, followed by materials used in product design (63%) and operational energy use during production (62%).

95%
of respondents stated that reducing environmental impact is a part of their role, with 64% stating it is a core part.

46%
use technology tools from a third-party supplier for material selection, and 40% to minimize energy consumption.

Complementing this assessment, in 2020 we surveyed attendees at a virtual Industrial Designers Society of America conference on sustainable design. Material choice, design for disassembly, manufacturing optimization, and waste reuse were among the areas where participants expressed the greatest priority and need for assistance. We'll use these insights as we develop the next generation of tools and features to support sustainable design across our products.

15 iea.org.
16 Ari Kahan, "EIA Projects Nearly 50% Increase in World Energy Usage by 2050, Led by Growth in Asia," 24 Sep. 2019, eia.gov.
17 Julian M. Allwood, Michael F. Ashby a, Timothy G. Gutowski b, Ernst Worrell, "Material Efficiency: A White Paper," Jan. 2011, sciencedirect.com.
18 Global Climate Change Analysis 2018," CDP, 2019, cdp.net.
19 The 10 industry sectors targeted in the online carbon management survey in October 2020 included automotive, building product manufacturing, consumer products (durable goods, appliances, and electronics), industrial machinery, manufacturing (engineering service providers and machine shops), plastics, and transportation (aeronautics, rail, and other). The survey targeted 600 respondents in the United States, from companies with 1 to 25,000+ employees, involved in specific job functions such as design, engineering, procurement, operations, and production.

Image courtesy of Decathlon



Decathlon

Revolutionizing bicycle design and production

French sports equipment manufacturer, Decathlon, is reimagining the biking experience with a lighter, stronger, customizable, and more sustainable bicycle.

Using the generative design capabilities of Autodesk® Fusion 360® software, Decathlon has already designed and produced a prototype bicycle fork. By eschewing carbon fiber (the industry standard for performance bikes, but also difficult to recycle) and planning instead to 3D-print these bicycles from aluminum, Decathlon aims to reduce both the raw materials and transportation-intensive shipping required to build and deliver this futuristic racing bike.

Generative design, the Autodesk technology at the heart of these projects, is a form of artificial intelligence that provides hundreds of potential solutions to a given design problem. Powered by Fusion 360, the technology uses algorithms, machine learning, and computational geometry to quickly generate multiple solutions that meet the precise requirements set by the design engineer.

Learn more



WNDR Alpine

Engineering skis using sustainable materials derived from microalgae

WNDR Alpine (pronounced "wonder") is a ski equipment manufacturer based out of Salt Lake City, Utah, that uses Fusion 360 software to engineer skis from sustainable, high-performance materials derived from microalgae instead of petroleum. Fusion 360 enabled the WNDR team to significantly reduce the amount of waste generated during production by about two pounds of landfill input per manufactured ski. Additionally, microalgae is a renewable resource, maturing in five to seven days—compared to millions of years for fossil fuels.

Matt Sterbenz, the founder of WNDR, says, "We're able to bring the ski to life on the screen and identify areas where we can streamline the [production] process, so that we're only using as much of our urethane as we're actually going to need in the final good. Without Fusion 360, we would not be able to realize these waste savings. Using Fusion 360 enables us to have this rate of acceleration to market," he adds. "The speed of innovation it provides WNDR Alpine is unparalleled, because it gives us the ability to react to trends before any of the big brands can step in."

To help advance the industry, WNDR invites other companies to explore the benefits of microalgae in everything from tennis shoes to jackets and even other brands of skis.

Learn more

The Autodesk® Product Design & Manufacturing Collection and our cloud platform support sustainable design in a broad range of areas.

Generative design

Generative design capabilities in Fusion 360 can inform part consolidation and material use reductions. New features added in 2020 improve users' ability to estimate costs by defining specific materials for manufacturing processes within a given scenario. The recommendation settings panel, also new during the year, enables users to customize and determine the relative importance of criteria for exploring the outcomes of a study.

Learn more

3D printing

Fused Filament Fabrication simulation in Fusion 360, new in 2020, saves materials by helping users to predict and avoid common print failures. The Additive Build Extension unlocks extra additive manufacturing technology to help users produce lighter, stronger, better-performing parts while reducing material use, waste, and cost.

Learn more

Manufacturing

Enhanced 3D Adaptive and Pocket toolpaths in Fusion 360 Manufacture workspace reduce machining time and energy use. The Arrange tool, a simplified version of Nesting added to Fusion 360 in 2020, helps optimize material yield by laying out cutting patterns to minimize waste. Utilizing automation to integrate design and manufacturing processes also helps designers and engineers achieve productivity boosts and deliver more sustainable products.

Factories

The Autodesk® Factory Design Utilities for Inventor® add-on supports efficient planning and validation of factory layouts and equipment placement to maximize production performance. This helps save time, money, energy, and materials that are often wasted due to poor design and inefficient production cycles, which create bottlenecks, machine idling, and slow product runs. Manufacturers can reduce energy use by up to 25% and increase productivity through smart and connected manufacturing techniques.[20]

Simulation

Explicit Dynamics Analysis, introduced in 2020, supports design for durability by simulating failure over time. Tolerance analysis helps users better understand the impact of mechanical fit and performance and explore multiple scenarios to enhance quality in part production, reducing waste.

See a summary of Autodesk Design & Manufacturing solutions that enable sustainable design.

20 McKinsey Global Institute, The Internet of Things: Mapping the Value Beyond the Hype.

Advance industries

Catalyze innovation

Through the Autodesk Foundation, we invest in entrepreneurs and innovators scaling early-stage technologies that have the potential to dramatically reduce greenhouse gas emissions. In addition to startups, we fund accelerators, incubators, and impact funds to bolster the growth of the climate startup ecosystem, increasing the number of climate technologies that reach commercialization. We prioritize sectors where our design and make expertise is particularly beneficial, such as renewable energy, electrification of transportation and refrigeration, building and industrial energy efficiency, and materials innovation and efficiency.

From electric aircraft to high-efficiency and low-emission home heating and cooling systems, the Autodesk Foundation portfolio is accelerating the transition to a low-carbon future.

7
startups and ecosystem partners scaling innovative technologies that reduce greenhouse gas emissions

21%
of Autodesk Foundation portfolio funding in fiscal year 2021

We currently invest in the United States, where emissions per capita exceed those of most other nations, but we recognize the importance of also enabling sustainable growth of technologies that combat climate change in both emerging and developing markets.

Read the Autodesk Foundation's Low-carbon Innovation impact brief.

BamCore

Reducing carbon emissions with bamboo

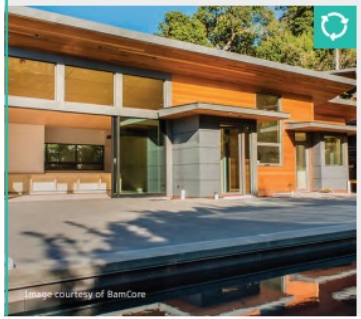
Image courtesy of BamCore

BamCore, a building technology startup, that manufactures prefabricated wall systems from timber bamboo was added to Autodesk Foundation's portfolio in 2020. The company's hollow wall framing solution shrinks a building's carbon footprint and speeds up construction. Builders using BamCore's Prime Wall system can eliminate 80% of wood studs, headers, and posts, saving materials and time. Because the panels are hollow, they transfer less heat and cold between inner and outer surfaces and can hold more insulation, lowering energy costs for the final occupant.

Using the Autodesk Forge platform, BamCore builds a 3D model of the panels that is then shared with the trades so they can design in mechanical, engineering, and plumbing features before panel fabrication. This interactive design fosters collaboration and streamlines the design, bid, and build process.

Once the plans have been finalized, the BamCore panels are precut at the factory to millimeter accuracy for every door, window, outlet, and access panel. MEPI maps and nail patterns are drawn onto the panels to eliminate rework and to speed installation. The walls are numbered, palletized, and delivered to the jobsite. No heavy equipment is required. Three laborers with a pneumatic nail gun can do the installation in half the time of conventional construction.

Learn more

Factor[e] Ventures

Powering energy, agriculture, waste, and mobility solutions


Image courtesy of Factor[e] Ventures

Factor[e] Ventures is a team of impact venture builders providing risk capital and technical resources to early-stage entrepreneurs turning challenges in energy, agriculture, mobility, and waste into decarbonized solutions for emerging markets. Autodesk Foundation has invested in Factor[e] since 2017, supporting their industrial design team to scale impact-forward innovations.

Factor[e] provides its portfolio companies with in-house industrial design support to facilitate product and system design, development, and manufacturing while reducing costs, helping them scale faster with less risk and greater impact. Each organization in Factor[e]'s portfolio requires rapid cycles of product development, which they are able to achieve with donated software and technical training and resources from Autodesk's Technology Impact Program. Factor[e]'s portfolio uses Fusion 360 and Inventor to design and improve innovations such as solar conduction dryers, motor sensors, electric motorcycles, and biogas generation technologies.

Learn more

Find New Friends

What roles to engage?

- Sustainability Manager/VP, Coordinator, Specialist, Lead
- Corporate Social Responsibility Manager
- Research & Development
- Innovation
- Environmental Health & Safety
- Product or Project Management
- Energy Management
- Facilities Management, Global Real Estate
- Supply Chain and/or Procurement
- Operational Health & Safety

DISCOVERY WITH QUESTIONS

- What corporate sustainability goals do you have?
- What are your sustainability areas of focus for the upcoming year?
  - What would make these easier to attain?
- Is your company publicly committed to any broad-based sustainability initiatives (e.g. the RE 100, We Mean Business, Science Based Targets Initiative, etc.)
- Do you have any material use reduction targets?
- Do you have any energy reduction targets?
- How does regulatory compliance factor into your work?

- How do your corporate goals show up in department goals? Who leads these projects and what are their KPI's?
- What projects are in place to support these goals?
- What teams are involved? Who leads these project[s]?
- How are you using technology to support the projects?
  - OR: What tools do you use for sustainability analysis?
- How do you involve your supply chain in these goals and projects?
- Does your competition leverage the sustainability of its products in its marketing? Could you?

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Learn More

Autodesk FY21 Sustainability (Impact) Report

Need to an Autodesk Product Demo?

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Services

https://servicesmarketplace.autodesk.com/

Pricing and Part Numbers

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