Buildings of the FUTURE

Sustainable, Resilient, Hyper-efficient, People-centric

Planning for Sustainability and Resilience working towards a Healthy Building Environment

Kurt Gokbudak; CEM

Solution Architect October 18, 2021



The world of your building

Forecasts project a recovery in 2021, with the total building stock estimated to grow to

1.3 trillion ft²

in 2029 from 1.1 trillion ft².

Source: Global Building Stock Database 2Q20



The world of your building



of the world's CO₂ emission comes from buildings



natural + man-made disasters in the world in 2019 >30%

of the energy is wasted in buildings

~90%

of our time is spent indoors

Source: ¹ Architecture 2030, 2020 ² Facts + Statistics: Global catastrophes, Insurance Information Institute, 2020 ³ U.S. Environmental Protection Agency, 2020 ⁴ Joseph G. Allen, Healthy Buildings Program, Harvard University, 2019

© 2021 Schneider Electric, All Rights Reserved | Page 3

Life Is On Schneider

Two major transitions already underway



© 2021 Schneider Electric, All Rights Reserved | Page 4

Internal

Life Is On Schneider

The foundation of buildings of the future





Sustainable

Buildings today

- 30% of the world's energy (Source: IEA, 2020)
- 40% of global greenhouse emissions (Source: IEA, 2020)
- Rely on non-renewable energy resources

Buildings tomorrow

- **60% reduction** of carbon emissions by 2040
- At least 40% green, renewable electricity
- Influential to decarbonization of other industries





Resilient

Buildings today

- Only as good as their **weakest** link
- **Threatened** by weather, cybersecurity, health and outages
- Face peak highs and lows for utilization

Buildings tomorrow

- More than 70% of operations performed remotely
- Automation and predictive analytics to minimize outages and failures
- Cybersecurity protocols to minimize risk level





Hyper-efficient

Buildings today

- ~30% of construction cost is rework (source: Procore, 2018)
- **Disconnected**, disparate systems
- Under-utilized assets and space
- Reactive maintenance

Buildings tomorrow

- **Digital twin** leveraged from design to build, into the operation and maintenance phases
- Energy and building automation integrated by converging IT and OT systems
- Systems that are connected to each other and to the cloud





People-centric

Buildings today

- Required to implement new health and safety guidelines
- Challenged to improve occupant experience
- React to demands for safe and productive environment

Buildings tomorrow

- Monitoring of occupant levels and health indicators
- Significantly improved occupant experiences
- Semi-autonomously identify issues and take actions



Consideration of Ways Be Sustainable At Hor	to Turn off lights/electrical devices in my home when not in use	5%5%	20%	70%		
	Upgrade to energy efficient home appliances	8% 10	1%	44%	38% 37% 35%	
	Install energy efficient windows in my home	10%	13%	40%		
	Use fewer electrical devices/ appliances in my home	10%	20%	35%		
	Install new insulation	14%	20%	39%		27%
	Install a smart thermostat to improve energy efficiency at home	12%	17%	48%		23%
mate	Use energy efficient home building trials, even if they are more expensive	17%	18%	46%	6	20%
	nstall solar panels or other renewable energy sources at my home	13%	25%	Ę	50%	12%
	Install electric vehicle charger at my home	17%		40%	34%	9%
•	Unsure 🕒 Wouldn't consider this	I Wo	uld consider,	haven't done	Already has	/done this
© 2021 Schneider Electric, All Rights Reserved Page 10					L	ife Is On So

Internal



Sustainable

Resilient

Connect easily to solar, generator, and battery backup sources w n

Efficient

Personal



Sustainable

Resilient

Efficient

Monitor energy use down to the device level

Personal





Sustainable

Resilient

Efficient

Personal

Gain digital control over lighting scenes and where you send backup power during outages.



The path to more sustainable and net zero homes Net zero homes are growing in popularity because they produce as much energy as they consume, resulting in a zero energy bill and a carbon-neutral home.

There is an ever-increasing array of tools and technologies that make net zero homes achievable, including:

- Solar panels
- Energy-efficient certified appliances
- Geothermal pumps
- Smart thermostats
- Weather-sealed doors and frames
- Radiant floor heating
- Home energy management systems

Attitudes Towards Smart Home Products



of consumers believe smart home products should be standard in newly built homes.





The Connected Home Solutions approach to sustainable homes

- Keeps tabs on a home's electrical activity from anywhere via a phone or tablet
- Provides insights into energy use for greater savings
- Sends mobile alerts when appliances turn ON or OFF
- Integrates with Amazon Alexa[®], Google Home[™], Philips Hue, Wemo[®] Insight, and more



Safety, security and energy efficiency are high in the perceived benefits of smart home technology

Home safety/security (Net	67%		
Enhances home safety	50%	777	
Superior home security	45%		
The home safety and security are the #1 perceived benefit for installing smart ho	priority of consumers, and the biggest me		
Reducing my energy consumption	60%		
Lower energy costs	60%		
benefits for buying and installing smart	51%		
Peace of mind while away from home	47%		
More comfortable at home	45%		
Ability to personalize to my preferences in order to manage my home better	40%		
Contact-less / Touch free options	26%		
Provides a better 'work from home' experience	19%		
		Life Is On	Schneide Belectri

Enabling buildings of the future



Sustainable

Equipped with flexible energy assets and various electric sources

- Maximizing electrification
- Active energy management
- Positive energy buildings
- Resource-efficient design
- leveraging software
- Sustainable retrofits



Hyper-efficient

Seamlessly controlled by end-to-end digital platform

Better decision making, impacting:

- People needs
- Asset efficiency
- Space resources
 Energy cost



Resilient

Recover quickly and bounce back

- Remote operations
- Power reliability
- Cybersecurity

- Critical infrastructure and asset protection
- Flexible buildings



People-centric

Designed to be responsive to people

- Safer buildings
- Healthy buildings
- Comforts and experience

Putting control in the hands of users



© 2021 Schneider Electric, All Rights Reserved | Page 23

Life Is On Schneider

Schneider Implements Pilot Study on Healthy Buildings



Situation

- Schneider Electric implemented pilot studies across 21 different buildings throughout the globe.
- The team outfitted the buildings, with a family of sensors which measured CO2, VOC, Humidity, temperature, noise, and light.

The Solution

• The goal of the study was to connect the data streams and look at the performance of each element in aggregate.

Results

- Building managers empowered with this data adjust air quality management, decreasing complaints and increasing employee satisfaction.
- It is possible to use the IoT sensor information on health to automatically control the building.

Confidential Property of Schneider Electric | Page 24





Tenant's happiness index



Data is based on survey taken in 2019 from 298 employees in comparison to the old Schneider Electric Building in 2017.

© 2021 Schneider Electric, All Rights Reserved | Page 25

Life Is On Schneider

Buildings of the future across the life cycle



Operate Maintain



© 2021 Schneider Electric. All Rights Reserved.

Schneider Electric and Life Is On Schneider Electric are trademarks and the property of Schneider Electric, its subsidiaries, and affiliated companies. All other trademarks are the property of their respective owners.