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Innovative Power Solutions driving towards Carbon Neutrality and Greener Future

Francesco Muggeri

VP of Marketing & Applications, Power Discrete & Analog, APeC/China, STMicroelectronics

Global Challenges and Opportunities

Looking ahead to a sustainable living environment

Increased of population and demand for better lifestyle expectation

Demand for more energy above 30% by 2030 versus 2020*

Global Regulations and Standards

Raising mandatory environmental sustainability standards and reusable/ recyclable materials (i.e. Singapore's RSA and Green Building MasterPlan**)

Innovation and Progress

Speed-up adoption of new technologies to improve efficiency. (i.e. 80% of buildings to be green by 2030**)

Trends in sustainability

Sustainability driven on all levels of society



Nations

China

2030: Peak Carbon Emissions
2060: Carbon Neutral

Europe & USA
2050: Carbon Neutral



Corporations

ST

2027 Carbon neutral
Commitment

- **83%** reduction in our PFCs emissions efficiency since 1994
- **51%** renewable electricity.
- Participating in Apple clean energy program
- **27%** direct & indirect emissions efficiency in 2021 vs 2020



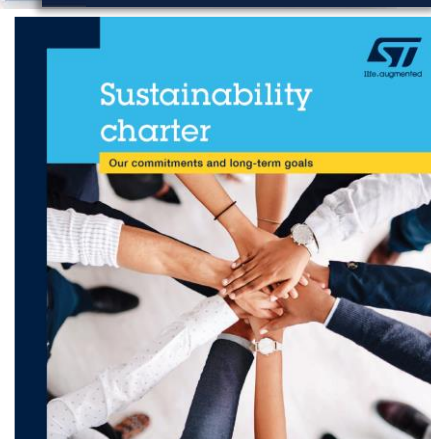
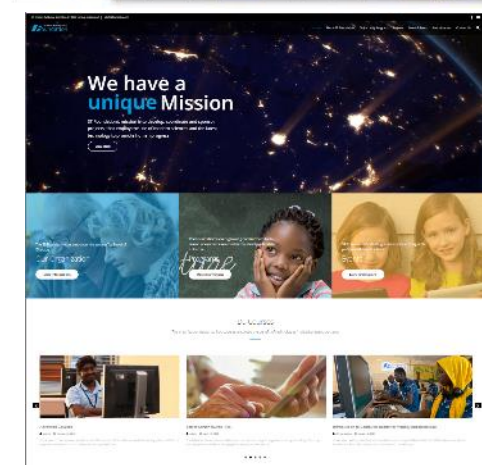
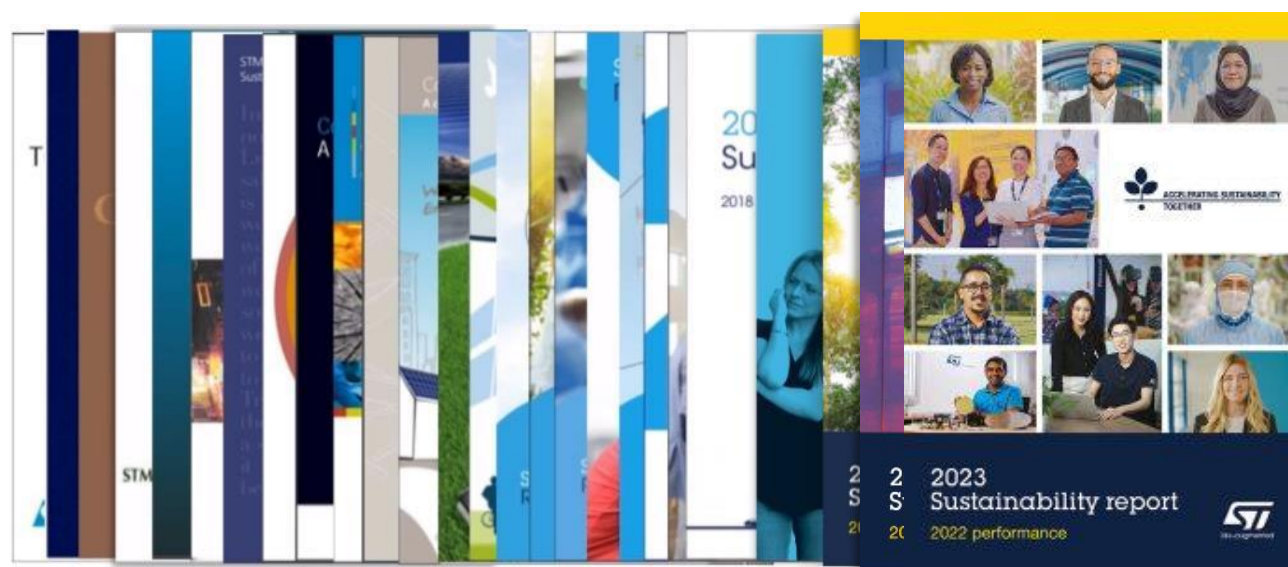
Individuals

Responsibility, awareness &
actions

Awareness & Actions



Sustainability has been engraved in our business model and culture for 30 years



1987	Creation of ST. Business conduct & ethics policy
1993	First environmental policy
1995	First environmental decalogue (long-term goals)
1997	First environmental report, ISO 14001, EMAS
2000	Signatory of the UNGC 10 principles
2001	Creation of ST Foundation
2002	Establishment of a reforestation program
2007	Conflict Minerals program
2011	Sustainable Technology program
2012	ISO 50001 energy management
2014	5 th Environment, Health & Safety Decalogue
2016	ISO 22301 Business Continuity 1 st certification
2019	2025 CO ₂ goal achieved
2020	Commitment to be Carbon Neutral by 2027*
2021	New Sustainability Charter published
2023	26 th annual Sustainability report

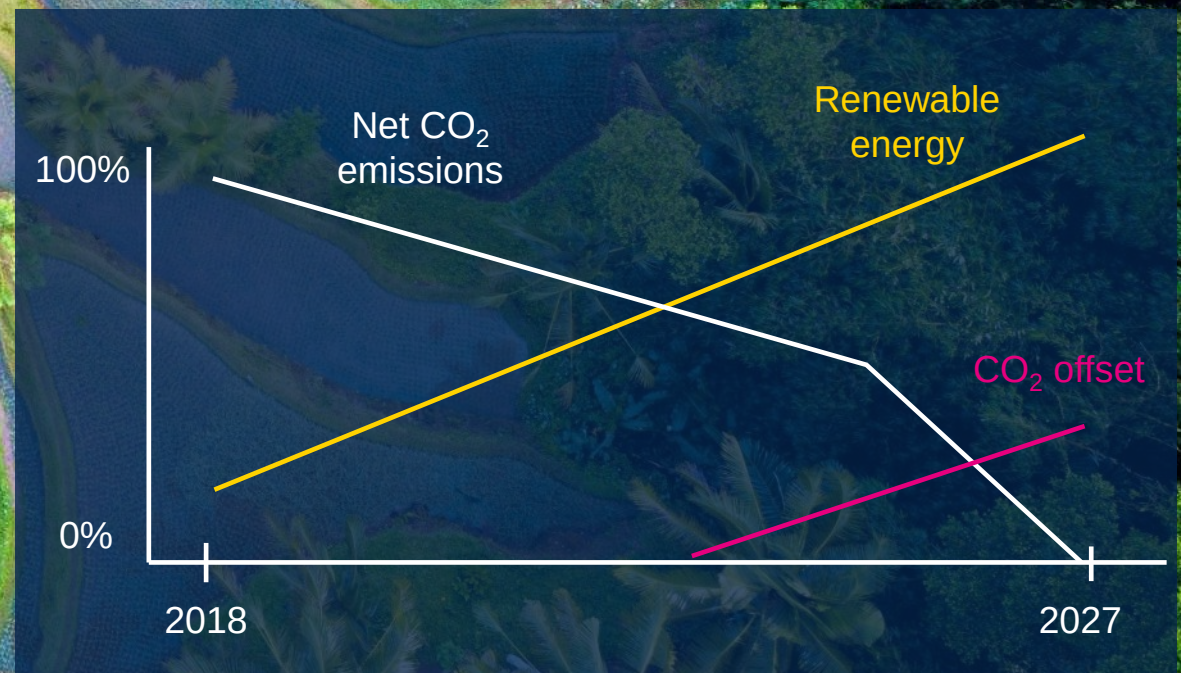


*on scope 1 & 2 and partially scope 3

ST will be carbon neutral by our 40th anniversary

Milestones

- Compliance with the 1.5°C scenario by 2025 – recognized by SBTi
- Carbon neutral by 2027
- Sourcing 100% renewable energy by 2027
- Collaborative programs and partnerships for carbon neutrality throughout our ecosystems



Smart City: District Cooling system

STMicroelectronics AMK Industrial Park District Cooling System Network



Smarter City

- STMicroelectronics supports Singapore Green Plan Initiative with the district cooling system
- 20% savings in cooling-related electricity
- Reduce Carbon Emissions up to 120KTons/yr

THE SINGAPORE GREEN PLAN 2030

A whole-of-nation movement to advance Singapore's national agenda on sustainable development.



We act as role model in creating value for all stakeholders

2.2 Million tons of CO2 avoided

16 Billions liters of water saved

53 Kilo tons of waste recycled



We are recognized as leader by all rating agencies



We are leading the industry in terms of sustainability performance

20%

energy efficiency
gain vs 2016
(2025 commitment)



35%

women in our
workforce

-40%

GHG emissions
scope 1 & 2 since
2018



86%

employee
engagement rate



30%

of women hired in
management and
engineering
positions

DJSI

included in World
and Europe indices



100%

of our products are
conflict-mineral free



23%

of our revenues from
responsible products



660+

community initiatives
worldwide

95%

of waste reused,
recovered or
recycled

100,000+

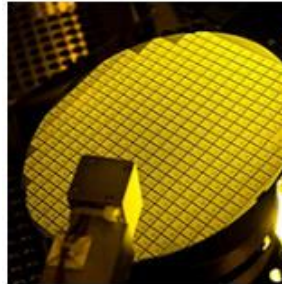
beneficiaries of our
STEM your way
program

186

R&D partnerships

0.10

Recordable case
rate for employees –
among the best-in-
class



62%

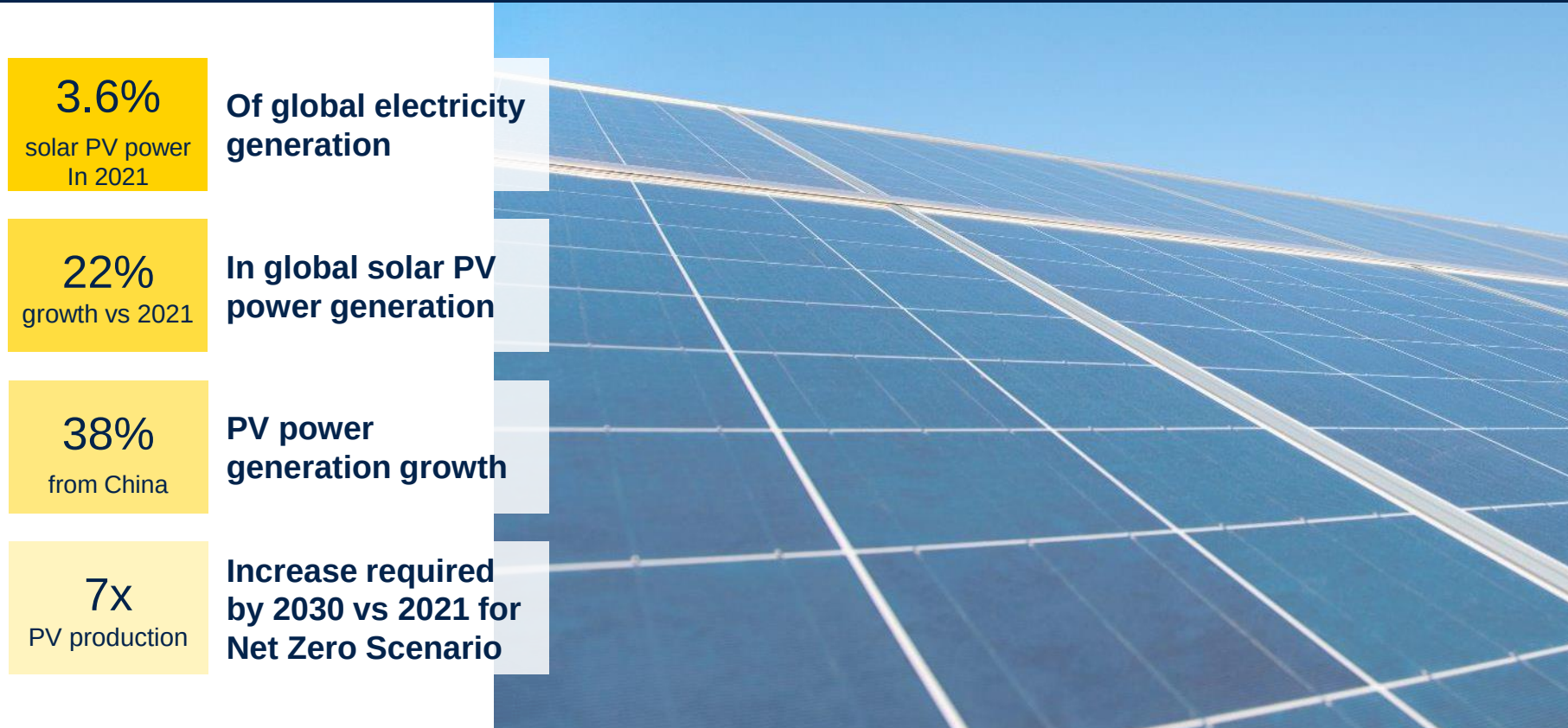
of renewable
electricity
(100% by 2027)

13,700+

people trained in
diversity and
inclusion

Solar power generation a key contributor to sustainable energy

Generate, Store, & Share electricity thanks to semiconductors



Key ST Devices

Inverter

WBG* & Silicon Power MOSFETs, IGBT
Power Modules
Rectifiers, fast diodes
Galvanic isolated drivers

Power management

WBG & Silicon Power MOSFETs
Power Modules
Rectifiers
PWM controllers
Galvanic isolated drivers

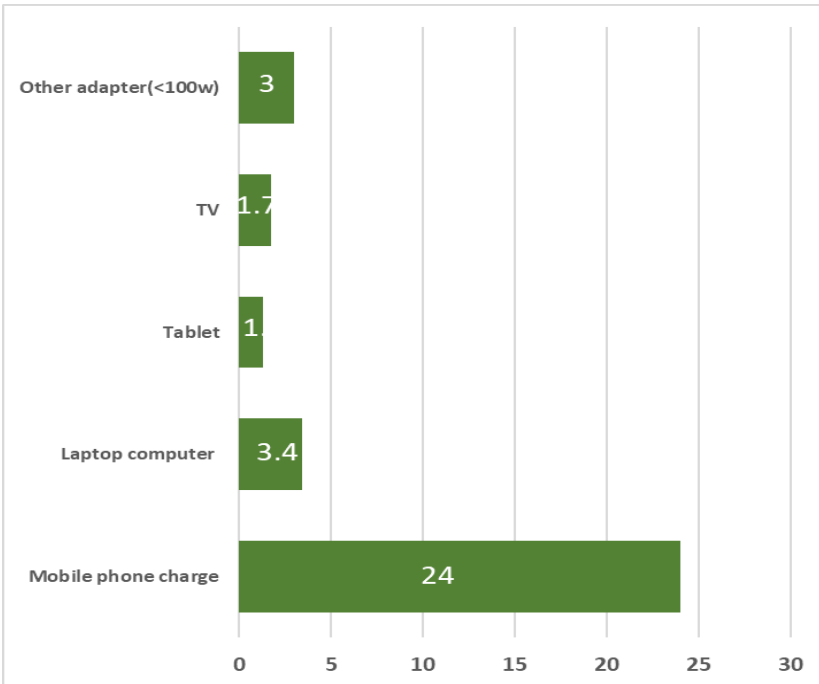
Battery management

Battery management ICs
Microcontrollers
Regulators

*WBG = Wide Bandgap Semiconductors such as Silicon Carbide and Gallium Nitride

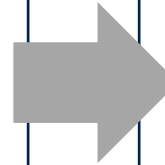
Global Energy: Impacts from Standby Power

Total Number of Equipment
in Use Yr22 (Bn)



23,015 TWh:
total worldwide electricity consumption
(2020)

65mW current
AVG standby
power to
5mW
(Zero Standby
Power)



we will get a
total energy
saving of
**17.56
TWh**

By reducing our energy consumption,
we can reduce our carbon footprint

60mW/unit energy saving equals
~ 3 standard nuclear plants



11.01 MMBOe

2.31 M tce



4.38 Tg CO₂

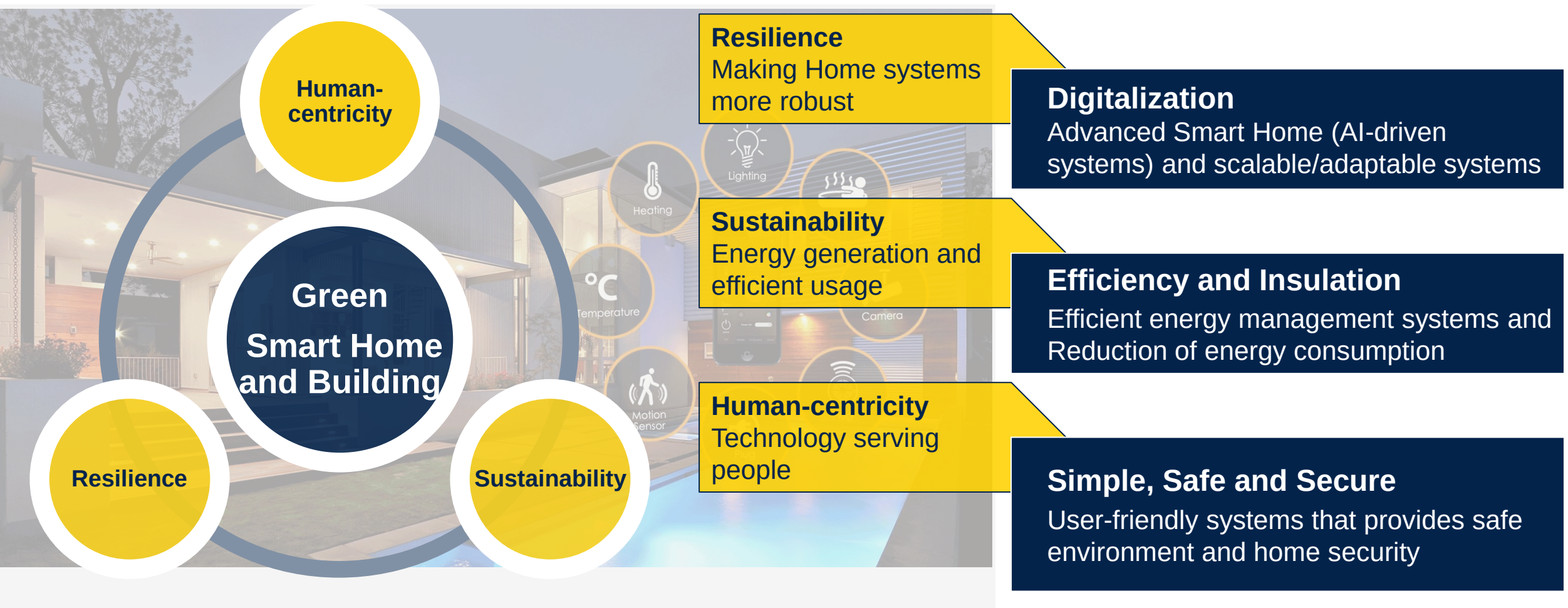


tce: tonnes of coal equivalent, **toe:** tonnes of oil equivalent

MMBOe: Million Barrels of Oil Equivalent

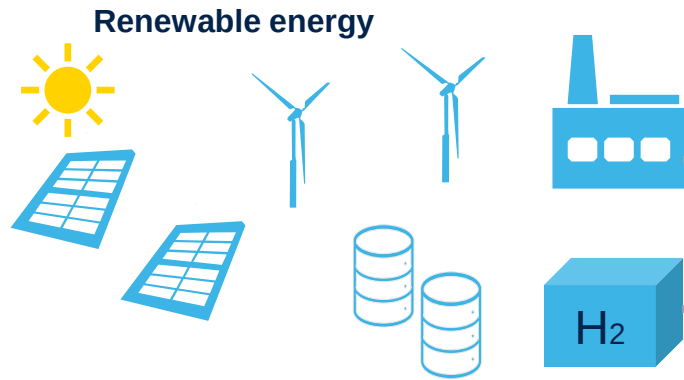
Sources: Statista, EarthWeb, STMicroelectronics

Innovation trends

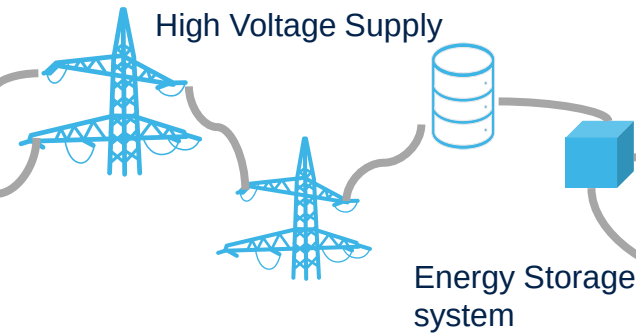


Power & Energy: conversion chain

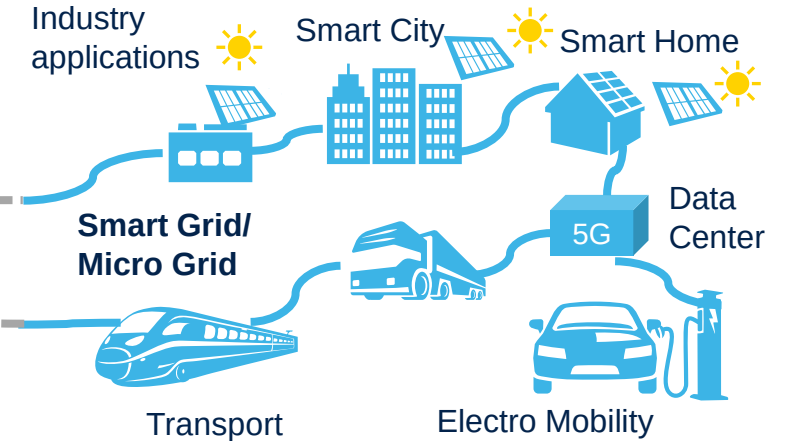
Energy Generation



Transmission/ Storage



Consumption



Centralized Energy Generation

- Solar: 19% CAGR (2022-27)¹
- Wind : 13% CAGR (2022-27)¹
- Energy Storage: ~30% CAGR (2022-30)²
- Energy Distribution

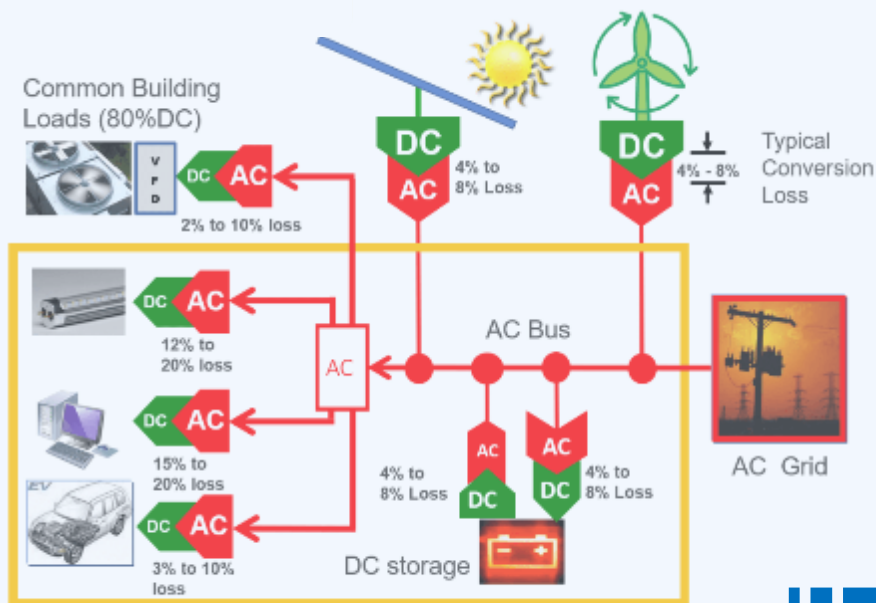
Energy Distribution/Management

- Smart Grid: 19.1% CAGR (2021-26)³
- Energy storage
- Automated Energy Management: 12.67% CAGR (2022-27)⁴

Distributed Energy Generation

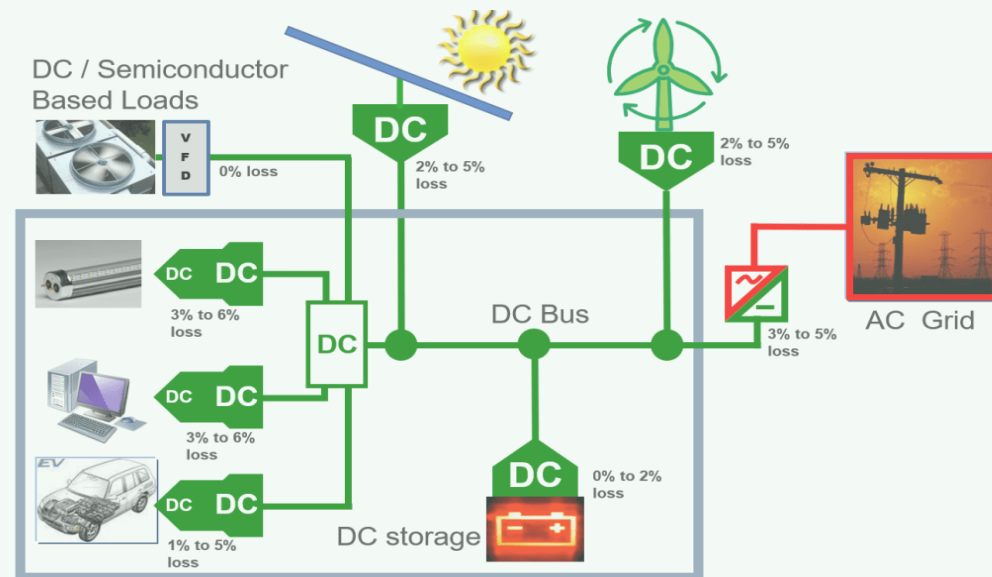
- Smart Agriculture (Global CAGR 9.4%, 2023-28)⁵
- Manufacturing & Process Automation (CAGR 8% 2022-25)⁶
- NEV (China): 38.24% CAGR (2021-26)⁷
- Charging Pile: 44% CAGR (2022-25)⁸

New Microgrid Architectures beyond 2025



AC Microgrid

**Improves
8-15%
Efficiency**



DC Microgrid

CurrentCDS

Set as non-profit, open, independent foundation for promotion and adoption of DC microgrid.

Objective is to provide free access to IP, for safe and stable.



Funded by Germany Federal Government.

For safe and robust energy, supporting connection to the supply grid and maximum use of decentralized, regenerative energy.

Leader in SiC MOSFET

Focus applications



Power supply



UPS



Solar Inverter



Industrial Motors



EV Charger



Traction



OBC, DC-DC

ST business perspective

>40%

Today market share automotive & industrial

>\$1B

SiC revenues in 2023

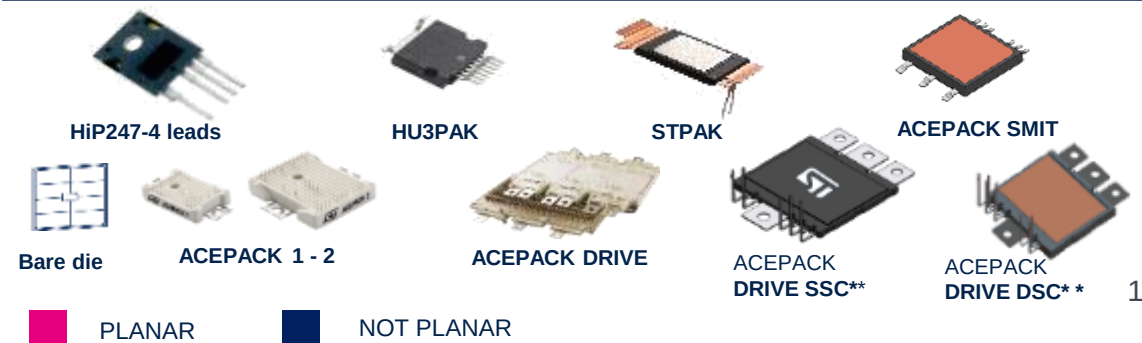
>115

projects in development

Current offer and roadmap: from 650 to 2200 V

Gen1	Optimized Ron and Tj for motor drive applications	■
Gen2	Balanced Ron and Qg for industrial and automotive	■
Gen3	Lower Ron vs. Gen2 maximizing the driving range of EVs	■
SiC VHV*	Very High Voltage SiC 2200V Available in bare die option	■
Gen4*	Lower Ron vs. Gen3 tailored for traction inverter	■
Gen5**	Innovative high power density technology structure	■
MDSiC**	Radical innovation, outstanding Ron value at hot temperature and further Ron reduction vs. Gen5	■

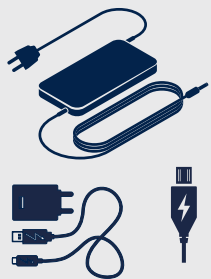
Advanced packaging





Benefits of GaN Technology

Adapter for tablet and notebook: fast charger



4x smaller

3x lighter

Server power supply and Telecom Base station

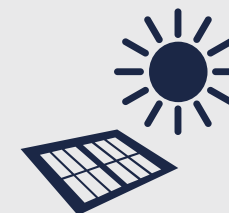


50%
higher power density



20% lower P_{LOSS}

Solar ESS (Energy Storage System)

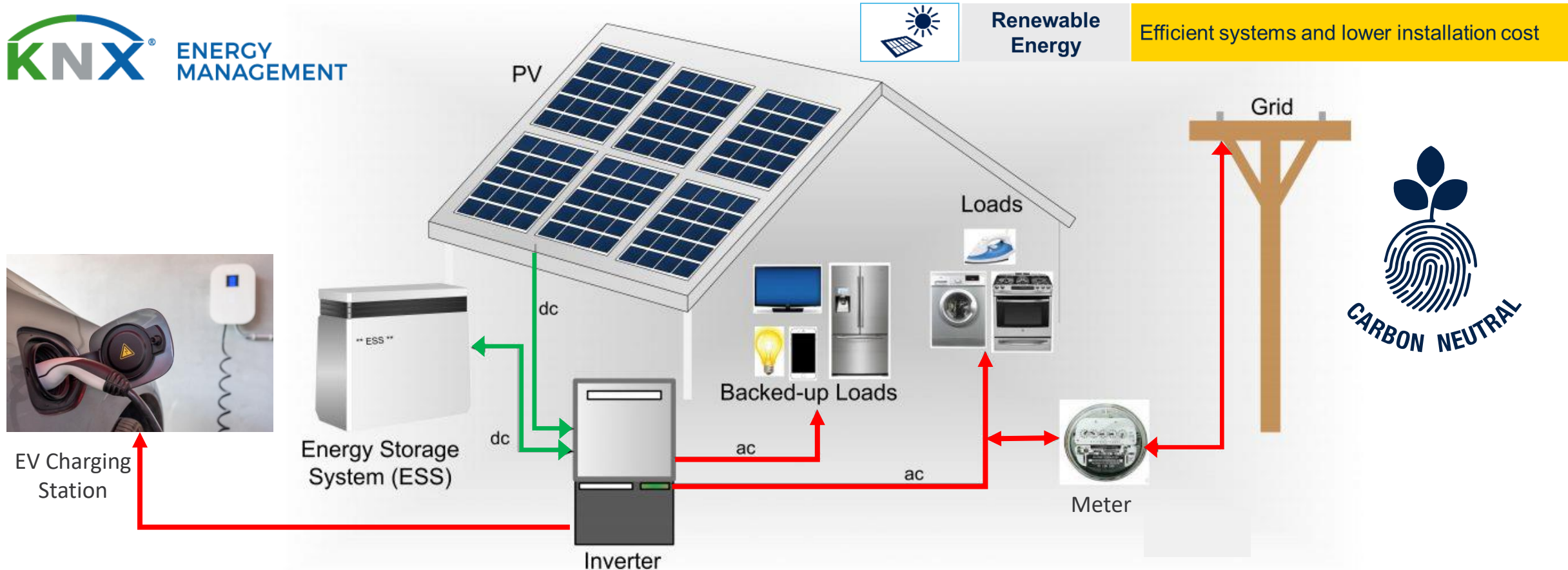


2x smaller

3x lighter

Renewable Energy and Energy Storage Systems

Addressing energy efficiency in Home, Building and City



Smart Home

Intelligent Usage of Energy at home



Energy Storage

Higher efficiency, Better Management and increased lifetime



Charging Station

Efficient usage of EV charging stations



Home Appliances

High Efficiency and smart utilization



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Home & building energy savings

Residential & commercial lighting, HVAC and appliances use >50% of total electricity consumption



>40%
Energy Saving

Washing machine
From Class D to Class A++



>30%
Energy Saving

Air conditioning
From analog to digital
From AC to BLDC control



>70%
Energy Saving

Digital consumer power supply
Efficiency > 98% in run mode
Stand-by power < 1mW



>80%
Energy Saving

Electronic lighting
From incandescent bulbs
to LED lighting

Smart Home and Building

- Lighting Management
- Heating-Ventilation-Aircon Management
- Energy Storage Systems
- Intelligent usage of EV charging Stations

**Adding more
intelligence to
bring the next step
in saving**

ST strong Commitment to Sustainability

ST is committed in Carbon Neutrality and Sustainability
We offer **very wide product portfolio** to facilitate our product adoption in customer designs and projects
ST provides you with **better power efficiency, smarter communication and more intelligent energy usage solutions** to address rising demand for renewable energies globally and for Smart Home and Building Automation





ACCELERATING SUSTAINABILITY TOGETHER

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