

# Huawei's Tech for a Better Planet

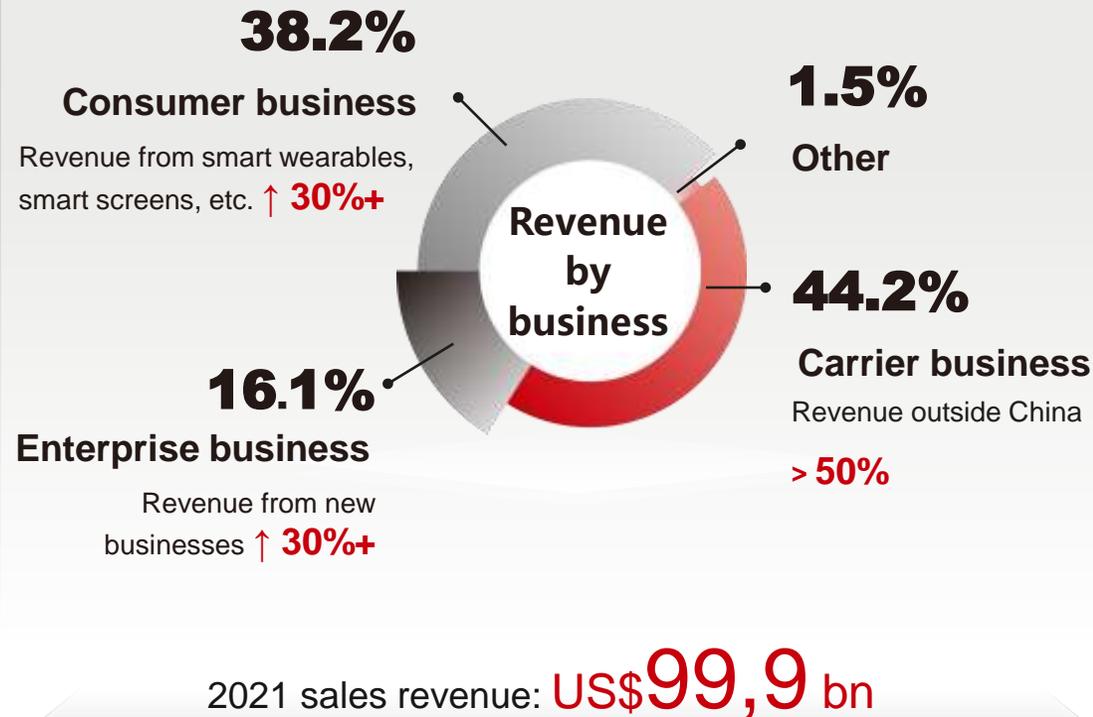
## More Bits, Less Watts

Michael Yang, CEO Huawei Technologies Switzerland AG  
asut apéro, 1 December 2022



# Solid operations and continuous investment in the future

## Solid performance in the ICT infrastructure business and rapid growth in new businesses



## Continuously investing in the future, creating more values to customers and society



# Huawei offices in Switzerland



## Liebefeld Bern

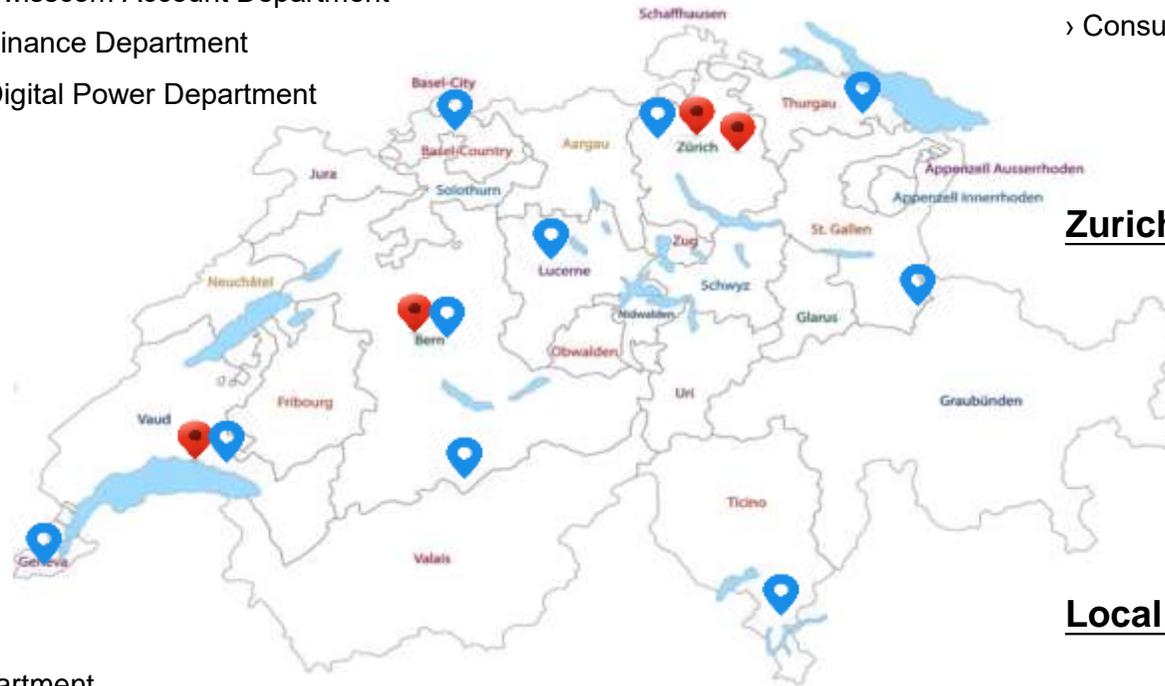
- › Headquarter
- › Swisscom Account Department
- › Finance Department
- › Digital Power Department



## St.-Sulpice Lausanne



- › Salt Account Department
- › International Standardization Department
- › Research Center



## Dübendorf Zurich



- › Sunrise Account Department
- › Enterprises Business Group
- › Consumer Business Group



## Zurich Research Center

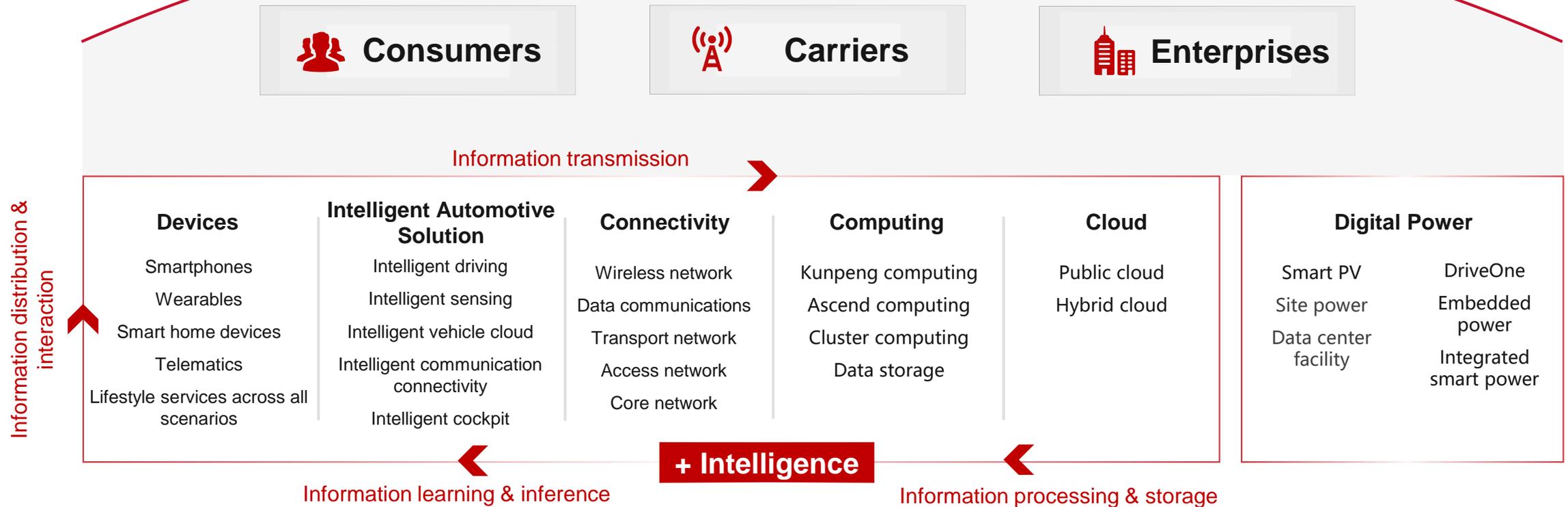


## Local Service Sites

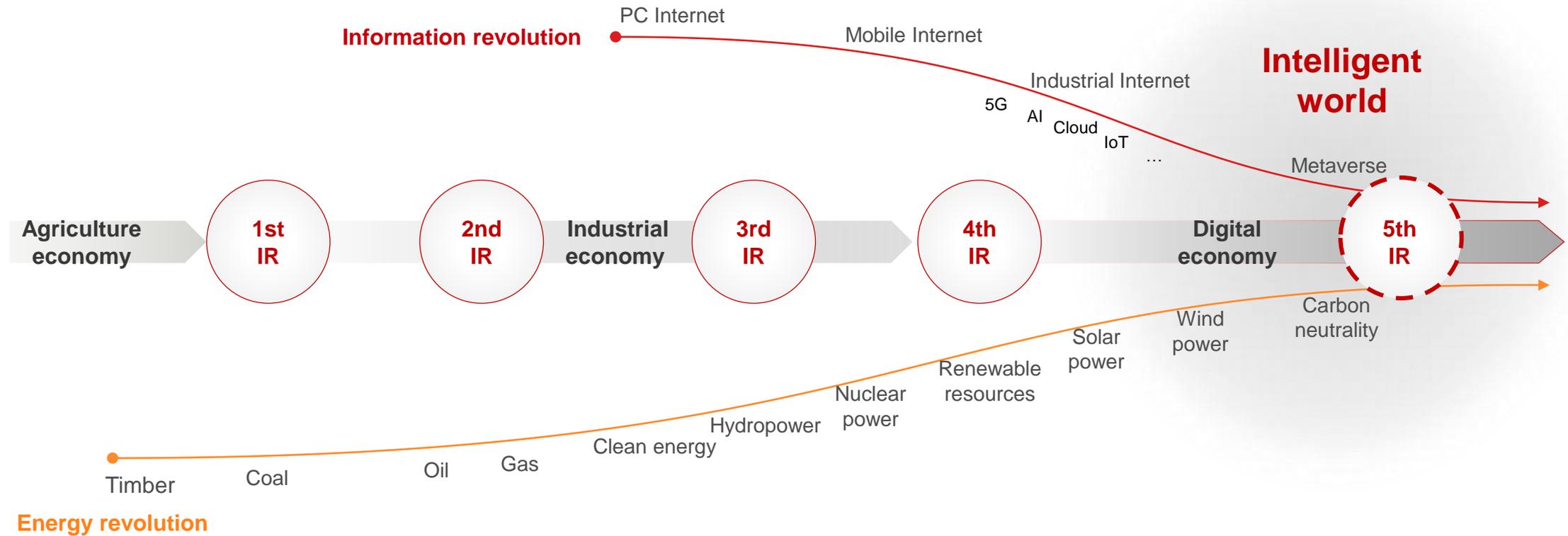


# Focusing on ICT to provide products, solutions, and services to three customer groups

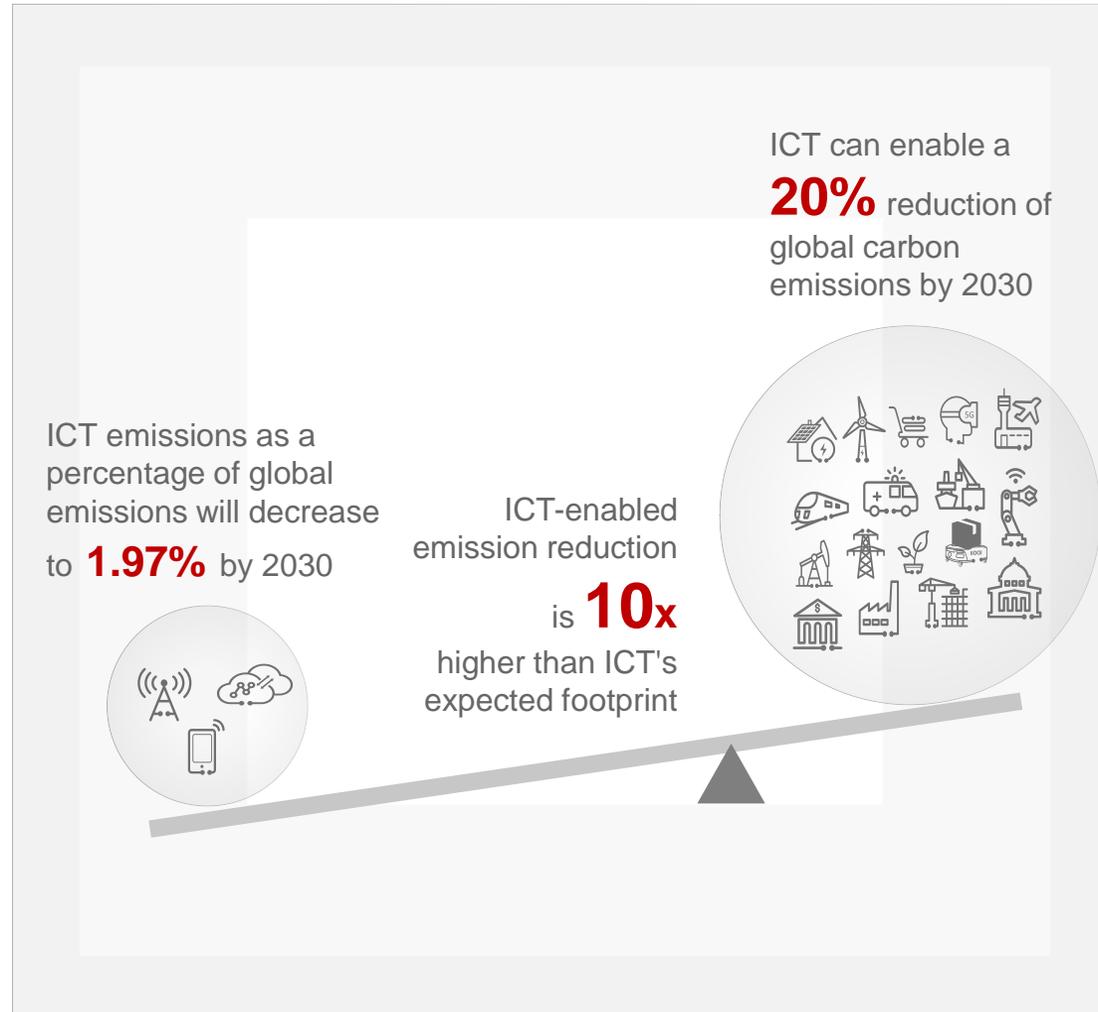
Bringing digital to every person, home and organization for a fully connected, intelligent world



# Hand-in-Hand: Industrial Revolution and Energy Revolution



# Enabling emissions reduction with ICT





Vision: Integrate digital and power electronics technologies, develop clean power, and enable energy digitalization to drive energy revolution for a better, greener future

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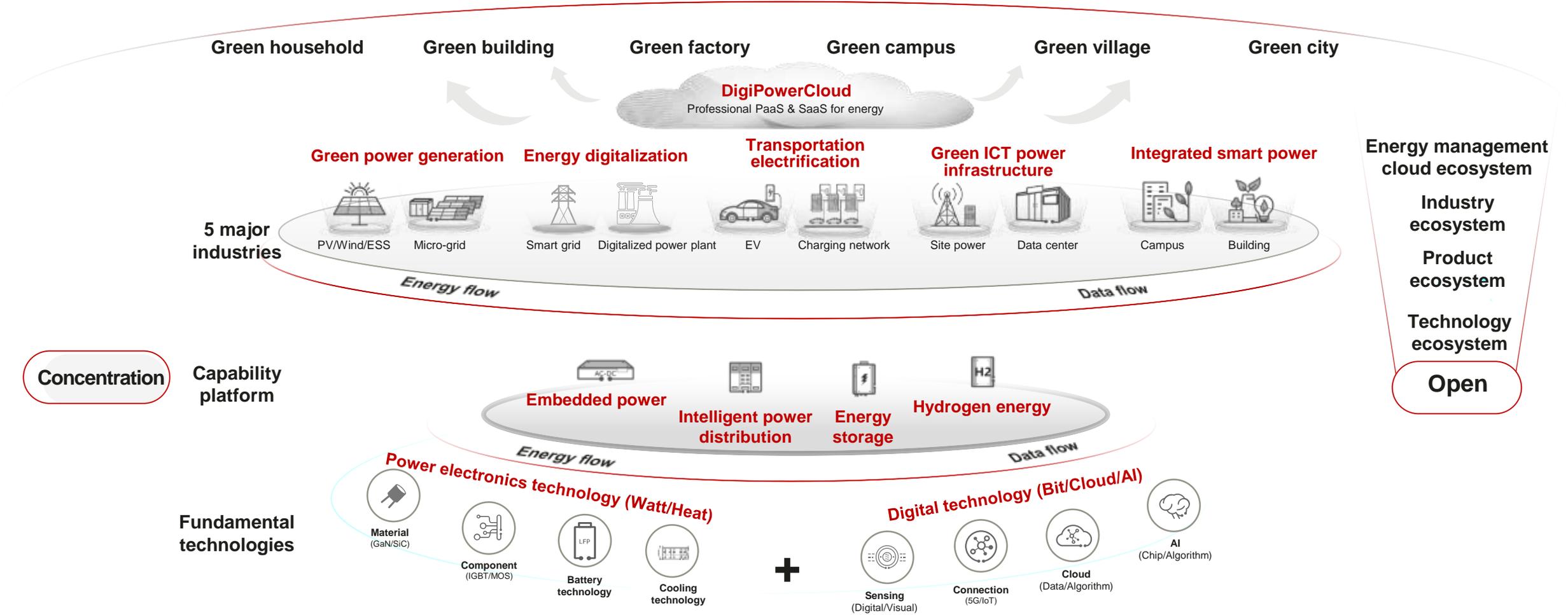
## More Bits, Less Watts

Felix Kamer, VP Digital Power, Huawei Technologies Switzerland AG  
asut apéro, 1 December 2022



# Drive Energy Revolution for a Better, Greener Future

Evolve the society from low carbon to zero carbon



# Green Deal Contributor

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Reducing carbon emissions



Promoting renewable energy



Contributing to a circular economy



Conserving nature

# Huawei's Green ICT Architecture for **More Bits, Less Watts**

Huawei Initiated NCI for the industry:



## 3-layer Solution for High Energy Efficiency

### E2E indicator system

Network Carbon Intensity - NCI

Network DC  
Site Equipment

### Green operations

Network operations User operations

### Green networks

All-optical Simplified Intelligent

### Green sites

Traditional site Green site Green DC

### Intelligent operations

Power consumption **10%↓**

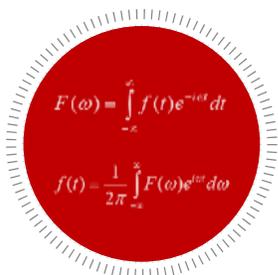
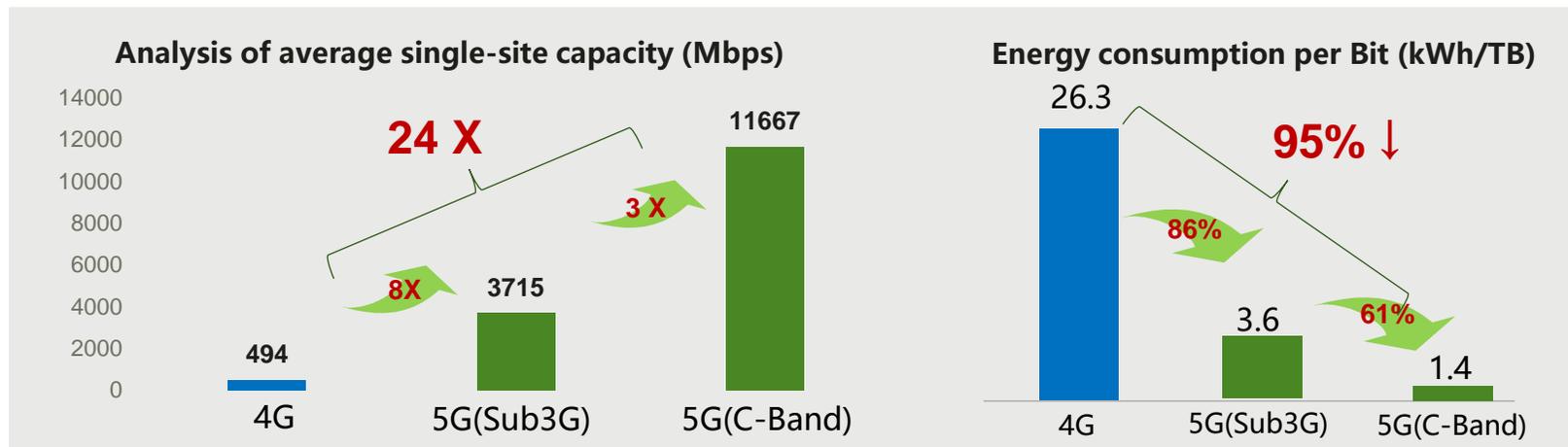
### All-optical

Carbon emissions **55%↓**

### Green sites

Carbon emissions **40%↓**

# Carbon Emission Reduction: Technological breakthroughs behind the scenes

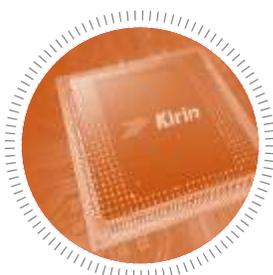


## Mathematical algorithms

(Basic algorithms for SingleRAN)

**80+**

Labs focusing on basic technologies

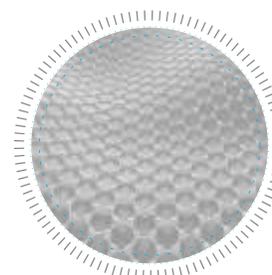


## Chipset design

First chip in 1991;  
30 years of experience

**700+**

Mathematicians



## Materials science

Corrosion resistance, adaptability to various environments, and efficient cooling with graphene

**200+**

Physicists and chemists



## Cooling technologies

Fan-free design makes base stations 30% smaller

**5,000+**

PhDs in engineering

# Green Data Center: Maximize the Natural Cooling Source

## Traditional Chilled Water System & Manual Optimization

Chiller      Colling Tower      Tank

CRAH      Pump      Plate heat exchanger      DCIM

7 devices, 4 heat exchangers

High energy consumption and high water consumption

VS



## Indirect Evaporative Cooling System + iCooling@AI

Efficient Cooling

automatic dust removal

Humidification & dehumidification

AI optimization

Two-in-one air valve

SmartLi

One container, one system, one heat exchange

Extreme PUE@AI, the most efficient in the industry

Traditional Solution		Huawei Environment Handling Unit (EHU)	
Cooling Load Factor (CLF)	0.2	0.1	Reduces cooling energy consumption by <b>50%</b> and save <b>\$600k</b> per year.
water usage effectiveness (WUE) (L/kWh)	1.2	0.7	<b>40%</b> water saving(= <b>\$130k</b> water fee per 10 years)

Model: 1500 racks, 8 kW/R IT load, 2N architecture, 50% load rate, 0.115\$/kWh electricity fee, 0.54\$/ton water fee, 1130\$/month/rack rental

# Promote PV renewable energy for everybody

## Residential PV



Residential, Germany  
10 kW

## Commercial & Industrial PV



Lakeside, Netherlands  
6.7 MW

## Utility size PV



Solar farm, Spain  
175 MW

# Industry and household green power

## Distributed green power scenarios



## Solar and storage convergence solution



Module optimizer



Smart PV Inverter



Energy Storage System



Energy cloud

### Traditional solution

### Huawei solution

### Solution value

#### Electricity generation\*

2,68 thousand kwh/year



3.48 million kwh/year

Lower electricity fees: 30% higher, saving 500,000 yuan per 25 years

#### Security

No security feature



AFCI+RSD

Active safety: L4 DC AFCI + 0 V fast shutdown of components

#### Compatibility

2 - 3 brands, poor compatibility



E2E solution

Better experience: one-stop solution and original experience

\*The calculation is based on a 30 kw home green electricity solution in Dongguan

# Circular economy: Full-lifecycle environmental impact reduction

## Recyclables

Devices use **10 kinds** of recyclable materials, including paper, gold, aluminum, cobalt, and tin.



## Device product recycling & reuse

Global recycling program for devices

In 2020, **4,500+ tons** of e-waste was disposed of through Huawei's own recycling channels



1

Material selection/design



2

Production & transport

## Greener packaging



FSC-certified paper  
Printing with soy ink  
Up to **78% lighter**

Plastic used in packaging of P50 phones: **< 1%**



4

End of lifecycle



3

Usage

## Longer lifespan with less resources

"**Three-tier repair system**" worldwide

In 2020 & 2021, **98%** of devices were repaired within 1 hour



# Use Technology to Conserve Forests, Oceans and Wetlands

## Objective

ICT enables a new approach to conservation

### Better protecting biodiversity

- Innovative digital solutions to study biodiversity
- More targeted measures to protect biodiversity

### Improve efficiency of conservationists

- Digital tools to improve the management efficiency in protected area

## Programs

### Forests



Protecting Wildlife in Greece with a Shield of Sound

**1250+** hours of sound recorded in the first three months

### Oceans



Oceans in Ireland: Cetaceans Protected by "Smart Whale Sounds"

**25,000** individual vocalizations recorded

### Wetlands



Protecting an Oasis of Biodiversity in Italy

**1,000** Real-time reports of possible illegal activity  
**300,000** Audio recordings of animal vocalizations

# More Bits, Less Watts

By 2021, Huawei Digital Power had helped customers:



generate  
**482.9 bn** kWh  
of green electricity



save  
**14.2 bn** kWh  
of electricity



reduce carbon emissions by  
**230 mn** tons



equivalent to planting  
**320 mn** trees

