

The Rise of M2M Devices

Heterogeneous Uses/Heterogeneous Requirements

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Cisco Visual Networking Index (VNI) – 10th Year Global IP Traffic Growth & Service Adoption

Cisco VNI Forecasts are complementary and statistically aligned.

**Fixed & Mobile IP
Traffic Forecast**



**Service Adoption
Forecast**

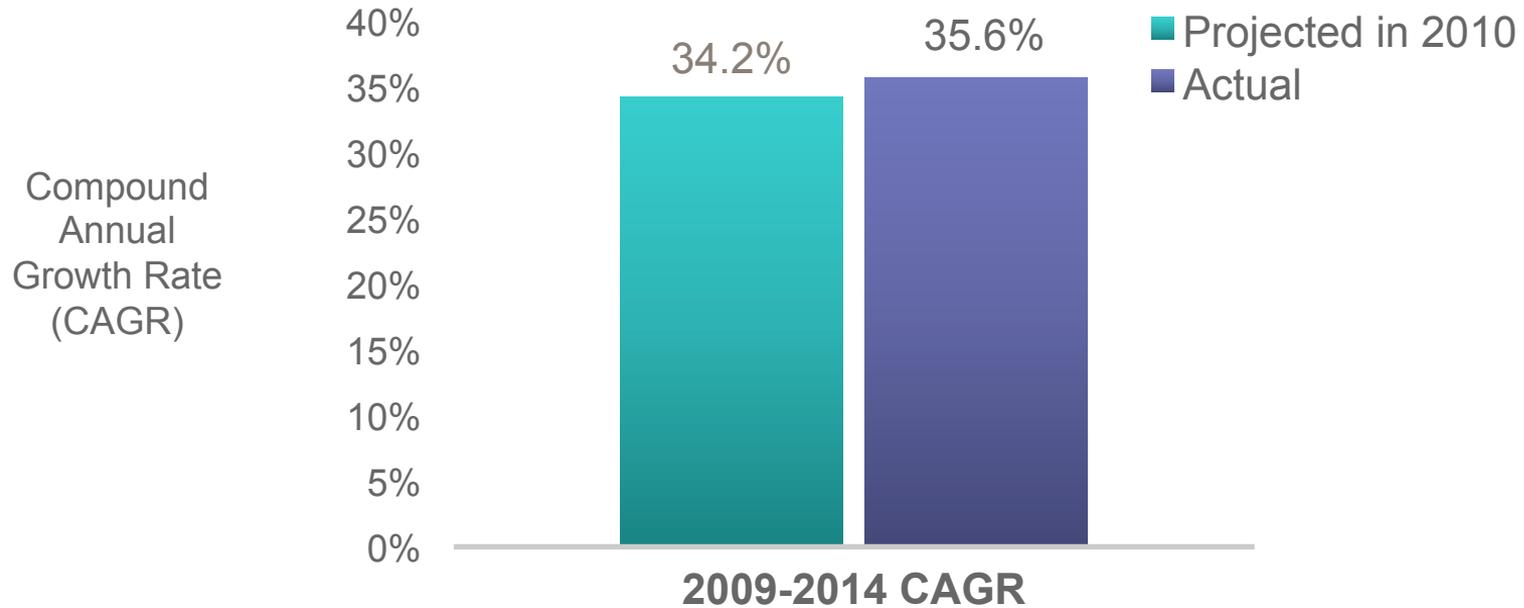


**Residential
Mobile
Business**



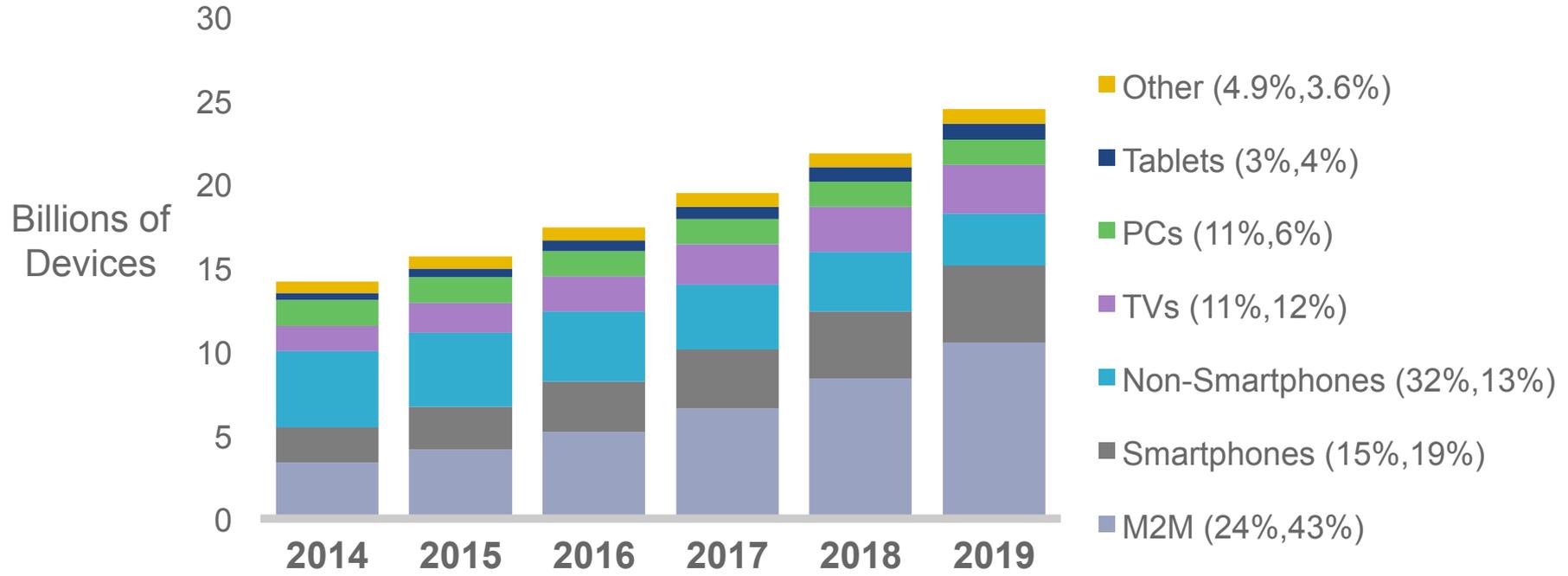
VNI Projections and Actuals (Global)

Actual Growth Has Been Within 10% of Projected Growth



Global Connected Device Growth by Type

By 2019, M2M Connections Will be More Than 40% of Total Connections



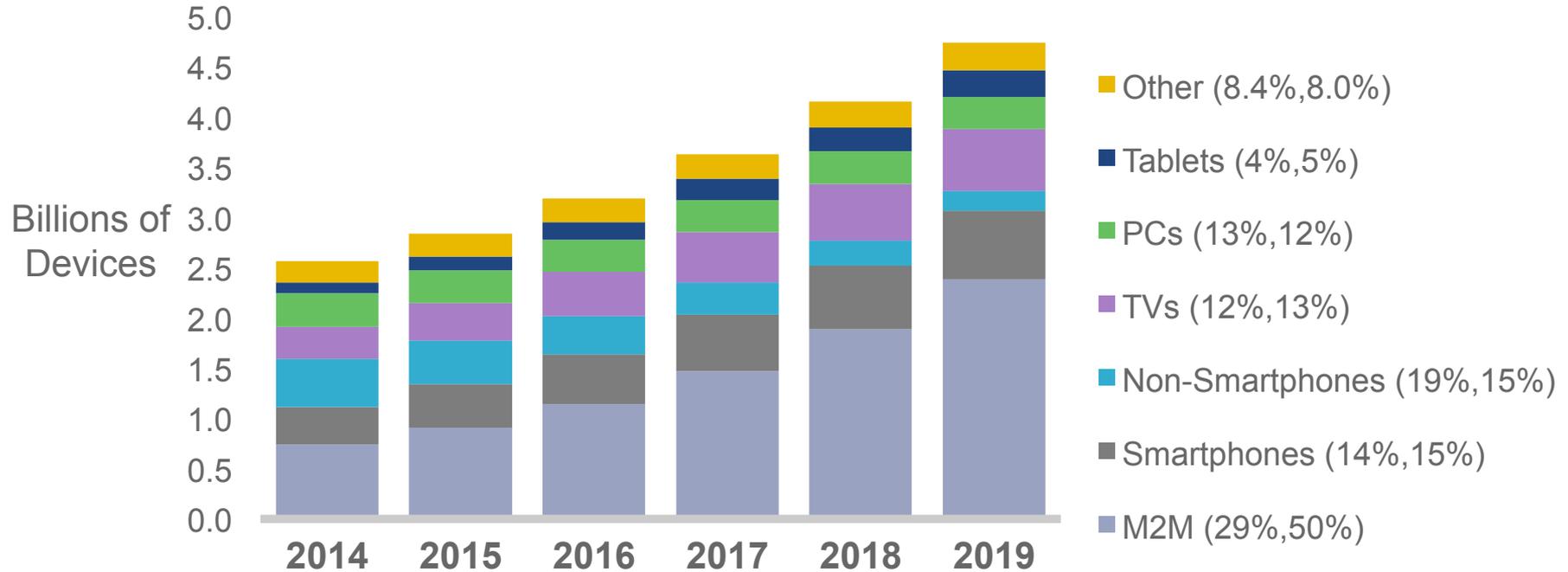
* Figures (n) refer to 2014, 2019 device share

Source: Cisco VNI Global IP Traffic Forecast, 2014–2019



Europe Connected Device Growth by Type

By 2019, 50% of Total Connections in Europe Will be M2M



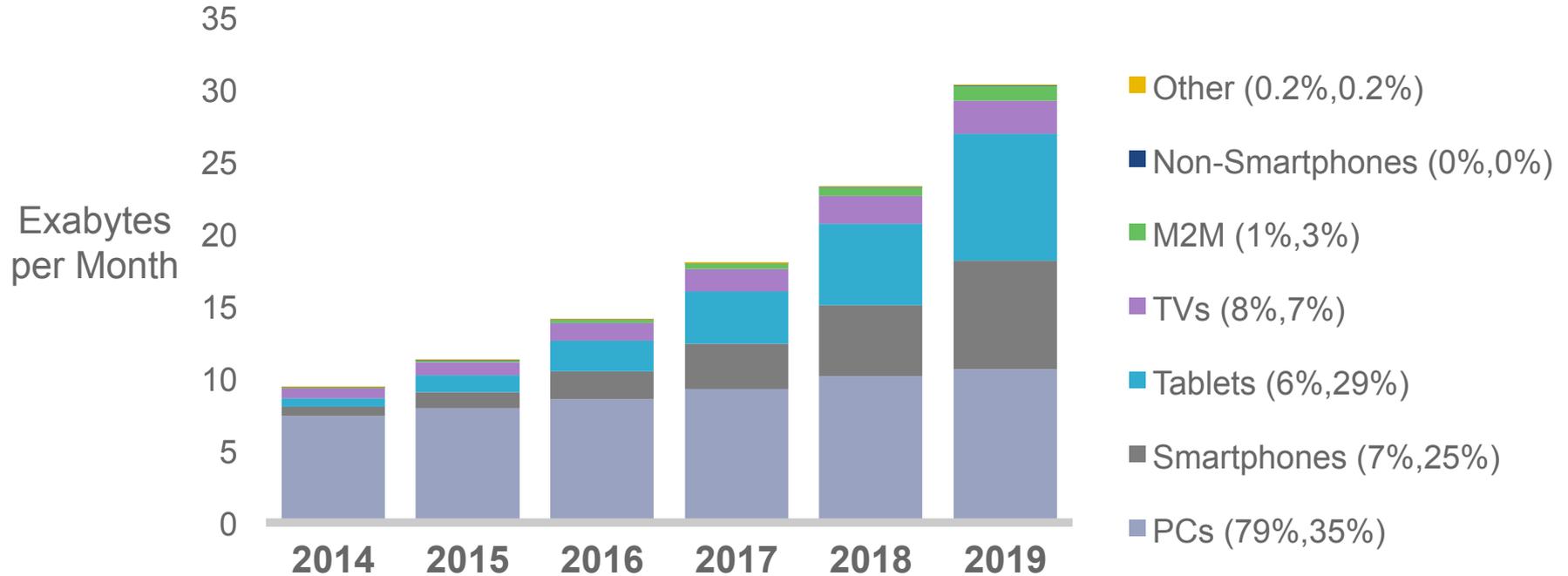
* Figures (n) refer to 2014, 2019 device share

Source: Cisco VNI Global IP Traffic Forecast, 2014–2019

*Note Europe defined as Western Europe + CEE, excluding Russia

Europe Internet Traffic by Device Type

M2M Traffic Only About 3% by 2019



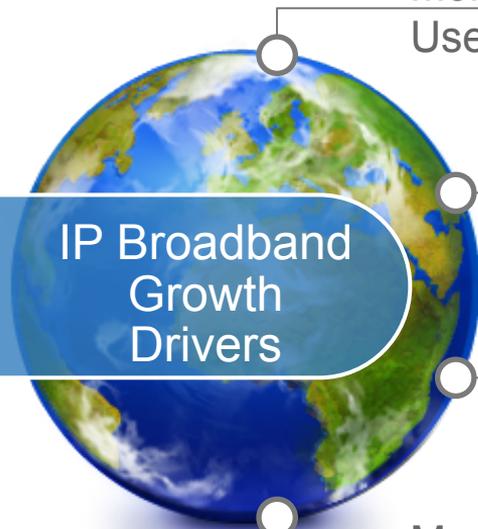
* Figures (n) refer to 2014, 2019 device share

Source: Cisco VNI Global IP Traffic Forecast, 2014–2019

*Note Europe defined as Western Europe + CEE, excluding Russia

Europe IP Traffic & Service Adoption Drivers

By 2019:



More Internet Users



| 2014 | 2019 |
|-------------|-------------|
| 514 Million | 596 Million |

More Devices & Connections



| 2014 | 2019 |
|-------------|-------------|
| 2.6 Billion | 4.7 Billion |

Faster Fixed Broadband Speeds



| 2014 | 2019 |
|-----------|-----------|
| 21.9 Mbps | 46.9 Mbps |

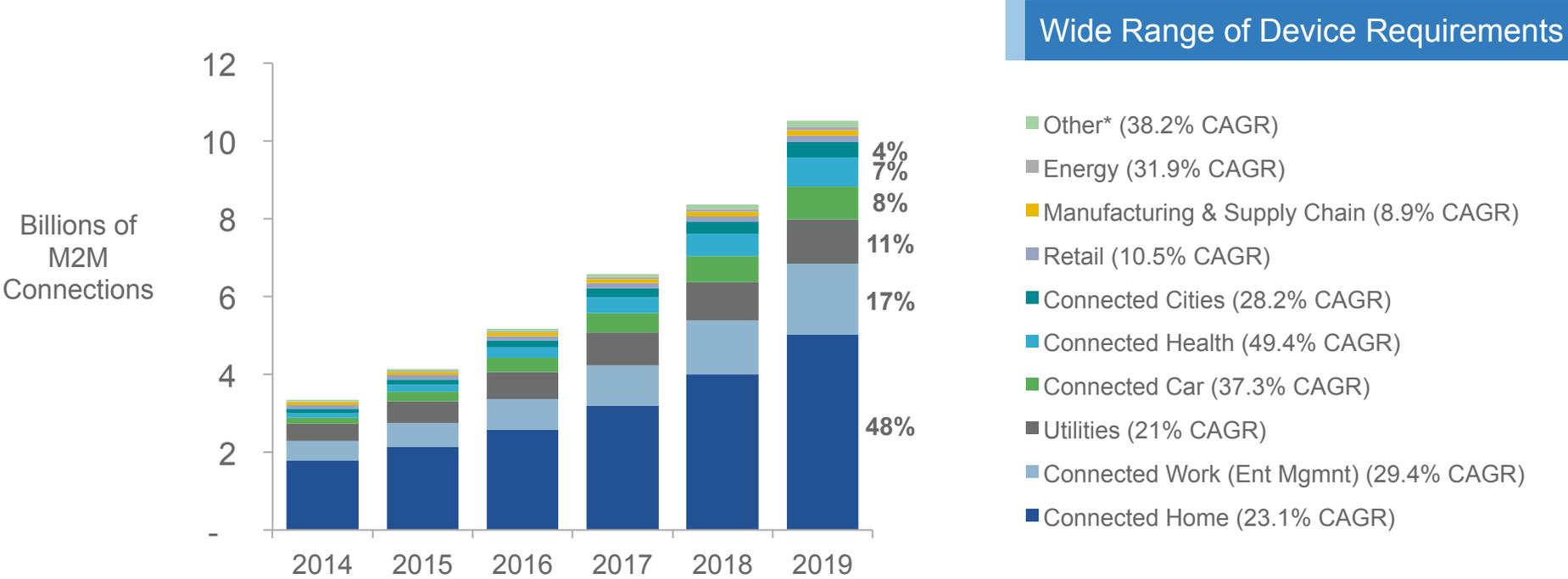
More Video Viewing



| 2014 | 2019 |
|----------------|----------------|
| 58% of Traffic | 78% of Traffic |

Global M2M Connections / IoE Growth By Vertical

Connected Home Largest, Connected Health Fastest Growth



*Other includes Agriculture, Construction & Emergency Services

Source: Cisco VNI Global IP Traffic Forecast, 2014–2019





Connected Home

- Home automation
- Building security
- Network equipment – printers +
- Network infrastructure – routers +
- White goods
- Tracking applications
- Household information devices



Connected Work

- Office building automation
- Building security
- Office equipment – printers +
- Routers +
- Commercial appliances



Utilities

- Electric vehicle charging
- Smart metering



Connected Car

- Fleet management
- In-vehicle entertainment systems, emergency calling, Internet
- Vehicle diagnostics, navigation
- Stolen vehicle recovery
- Lease, rental, insurance management



Connected Health

- Health monitors
- Assisted living – medicine dispensers +
- Clinical trials
- First responder connectivity
- Telemedicine



Connected Cities

- Environment and public safety – closed-circuit TV, street lighting, waste removal, information +
- Public space advertising
- Public transport
- Road traffic management



Retail

- Retail goods monitoring and payment
- Retail venue access and control
- Slot machines, vending machines



Manufacturing & Supply Chain

- Mining and extraction
- Manufacturing and processing
- Supply chain
- Warehousing and storage



Energy

- New energy sources – monitoring and power generation support apps
- Smart grid and distribution
- Micro-generation– generation of power, by residential, commercial and community users on their own property



Other

- Agriculture – livestock, soil monitoring, water and resource conservation, temperature control for milk tanks +
- Construction: Site and equipment monitoring
- Emergency services and national security

What is the **IoE Opportunity in Europe?**



Value Sources



What is the IoE Opportunity in Germany?



Value Sources



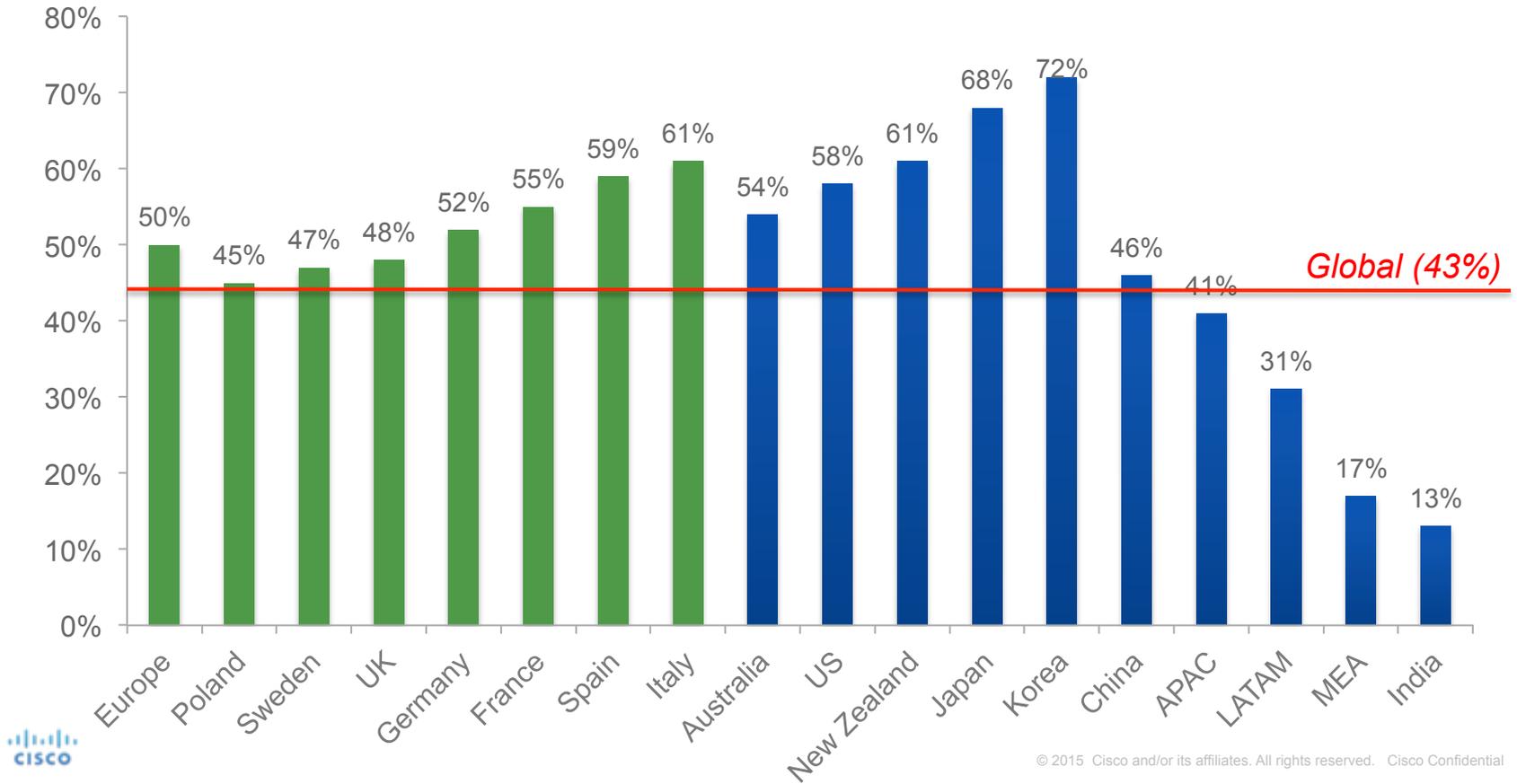
What is the IoE Opportunity in Portugal?



Value Sources



M2M Share of Devices (2019)



Key Takeaways

- IP-enabled M2M devices fastest growing
- Wide range of M2M devices for wide range of uses
 - Majority non-mobile
- Heterogeneous device requirements
 - E.g., distance, power, bandwidth, duration, latency
- Heterogeneous environments
- Heterogeneous spectrum requirements
- Heterogeneous regulatory requirements/regulators

