

# What does a Smart Home of the future look like?

Dr.-Ing. Michael Arndt, Bosch Thermotechnology GmbH

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## Agenda

1. Smart Home: Market
2. Smart Home: Domains
3. A Smart Home of the future – Energy perspective
4. Solutions for the Smart Home (Bosch Examples)
5. Conclusions



# What does a Smart Home of the future look like ?

## What is a Smart Home ?

„Smart Home“ comprises a set of technologies to improve quality of life, security and energy efficiency in residential homes

Enabling technologies are:

- Wired and wireless interconnectivity and data exchange between devices, appliances and domains (communication compatibility and data networks)
- Internet of things (IoT) technologies
- Human machine interface technologies
- Learning algorithms, Big data, data mining and analytics
- Usability (installation and control by the end customer although some specific solutions may require specialist knowledge and support)

**Smart Home idea is gaining speed due to availability of enabling technologies**

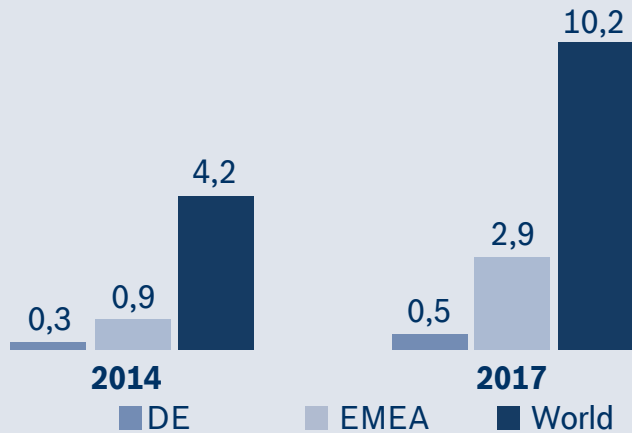


# What does a Smart Home of the future look like ?

## Market Key Findings

**10,2 bn** EUR market in 2017<sup>1</sup>

Thereof 0,5 bn EUR in DE<sup>2</sup>



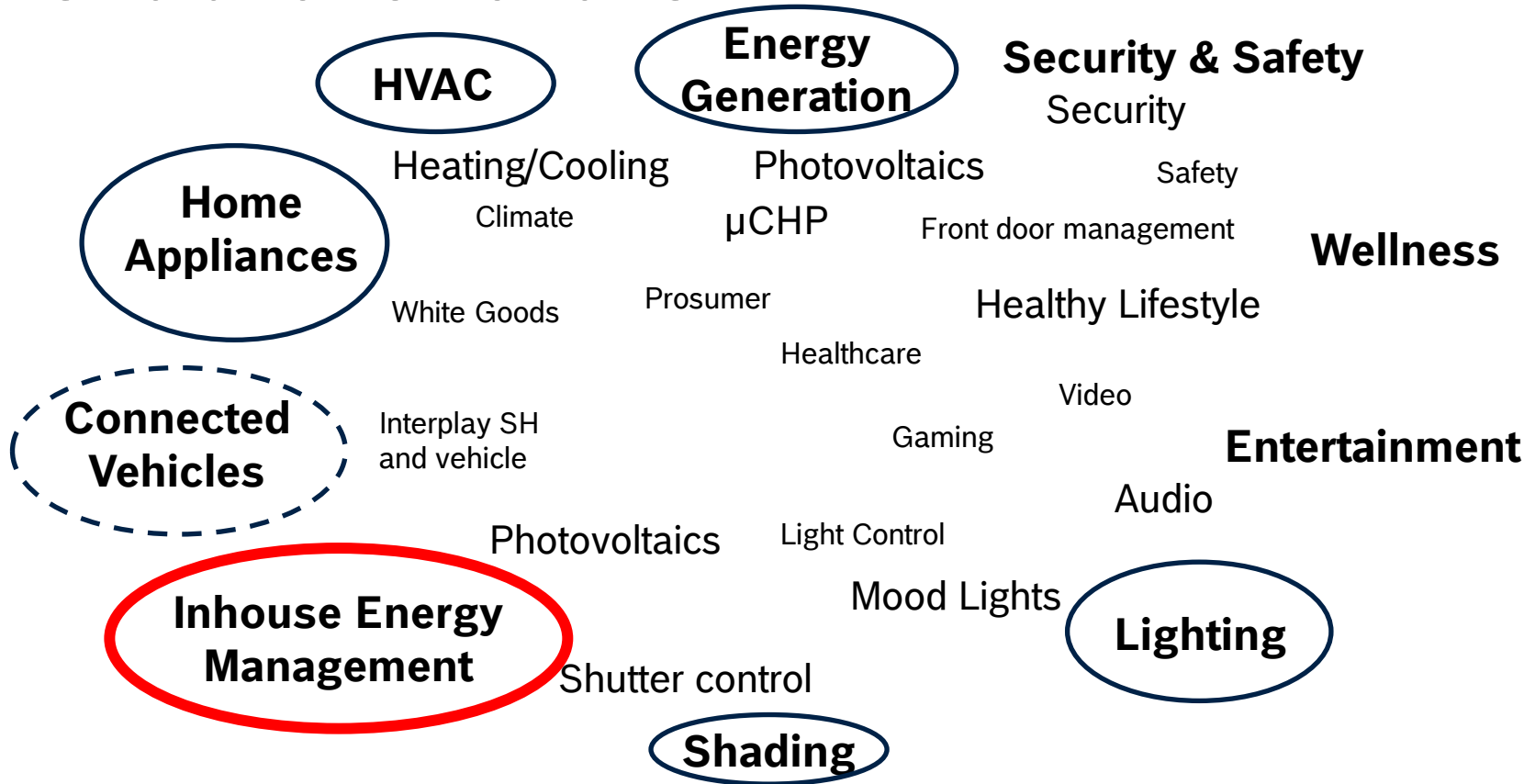
- Market environment fragmented
- No major players or trans-regional providers
- Key success factors not yet established
- Market rules and “killer” products and services not yet identified
- User focus on comfort and security

- 1) Source: IMS Research 2012, excl. high-end automation, incl. stand-alone and integrated gateways and nodes, services not considered
- 2) Source: Strategy Analytics DE 2013, “Self-monitoring and Control systems” and 50% of “Other smart systems”, services not considered

**Strong growth potential, markets still in an infant state, major players not yet decided**

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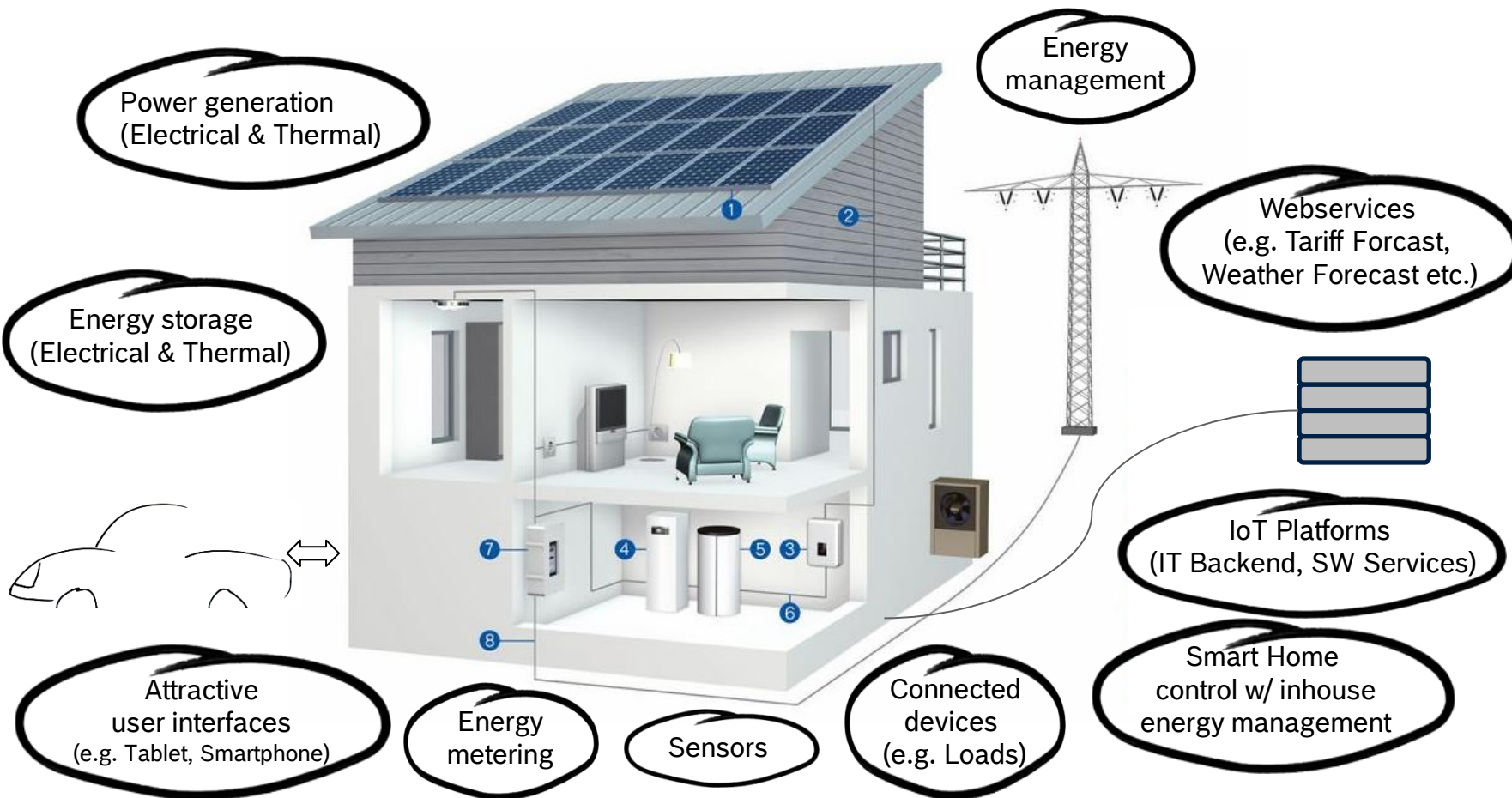
## Smart Home Domains



From Isolated domains to interoperability and cross domain functionality

# What does a Smart Home of the future look like ?

## A Smart Home of the future – Energy perspective



# What does a Smart Home of the future look like ?

## Example: Smart Thermostat

### Innovative control technology for domestic heating and hot water

- ➔ **Room controller** – Slim, modern design and high quality materials for a worthy premium product!
- ➔ **Simplified user interface** – No complicated functions, unnecessary buttons or programming. This makes it easy for everyone!
- ➔ **Smart Features** – Control and monitor your heating and hot water from your smart phone, track your daily energy usage. Use weather data provided by web services. Improve energy efficiency by self learning algorithms. Support your installer by giving him access to operational data and error messages.



**Intuitive and Learning Heating Control - Anytime from everywhere**



# What does a Smart Home of the future look like ?

## Example: Bosch Smart Climate



Window Contact

Thermostatic Valve

Smart Plug

Bosch Heating System

Smart Home Controller

Smart Home App

## Bosch Smart Climate – Integrating the Heating System into the Smart Home

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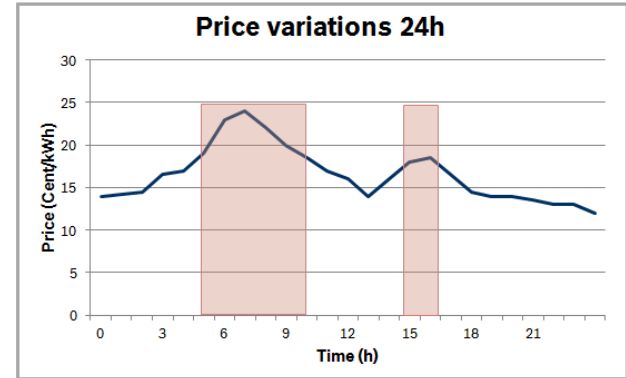
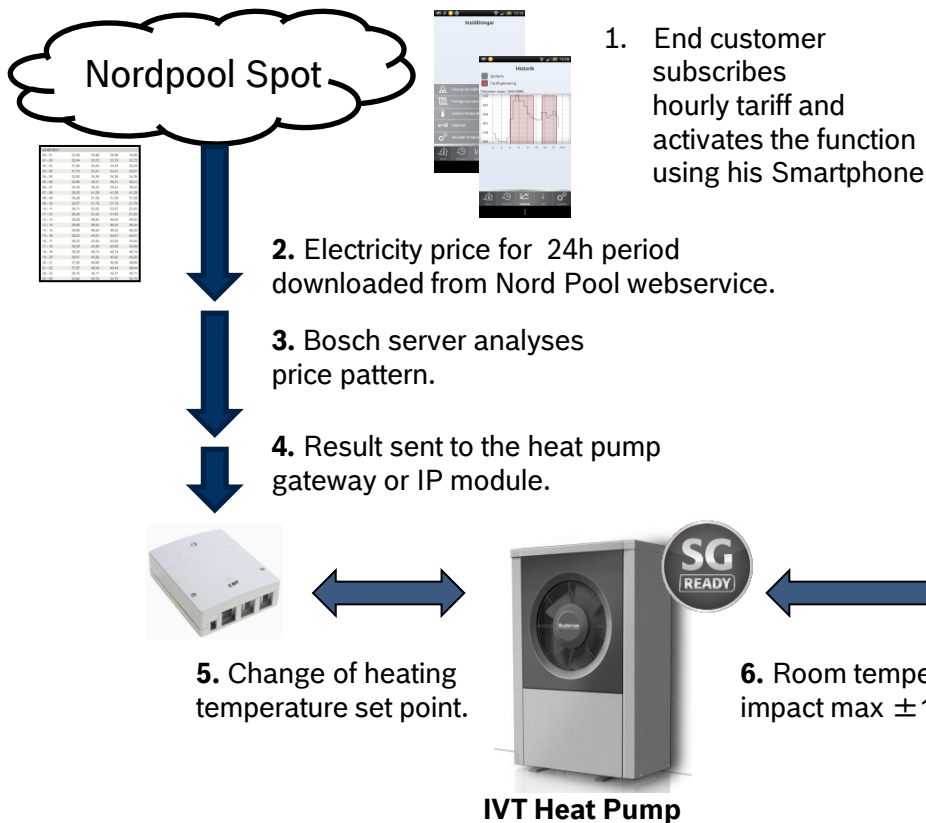


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## Example: Smart Heat Pump Control (Sweden)

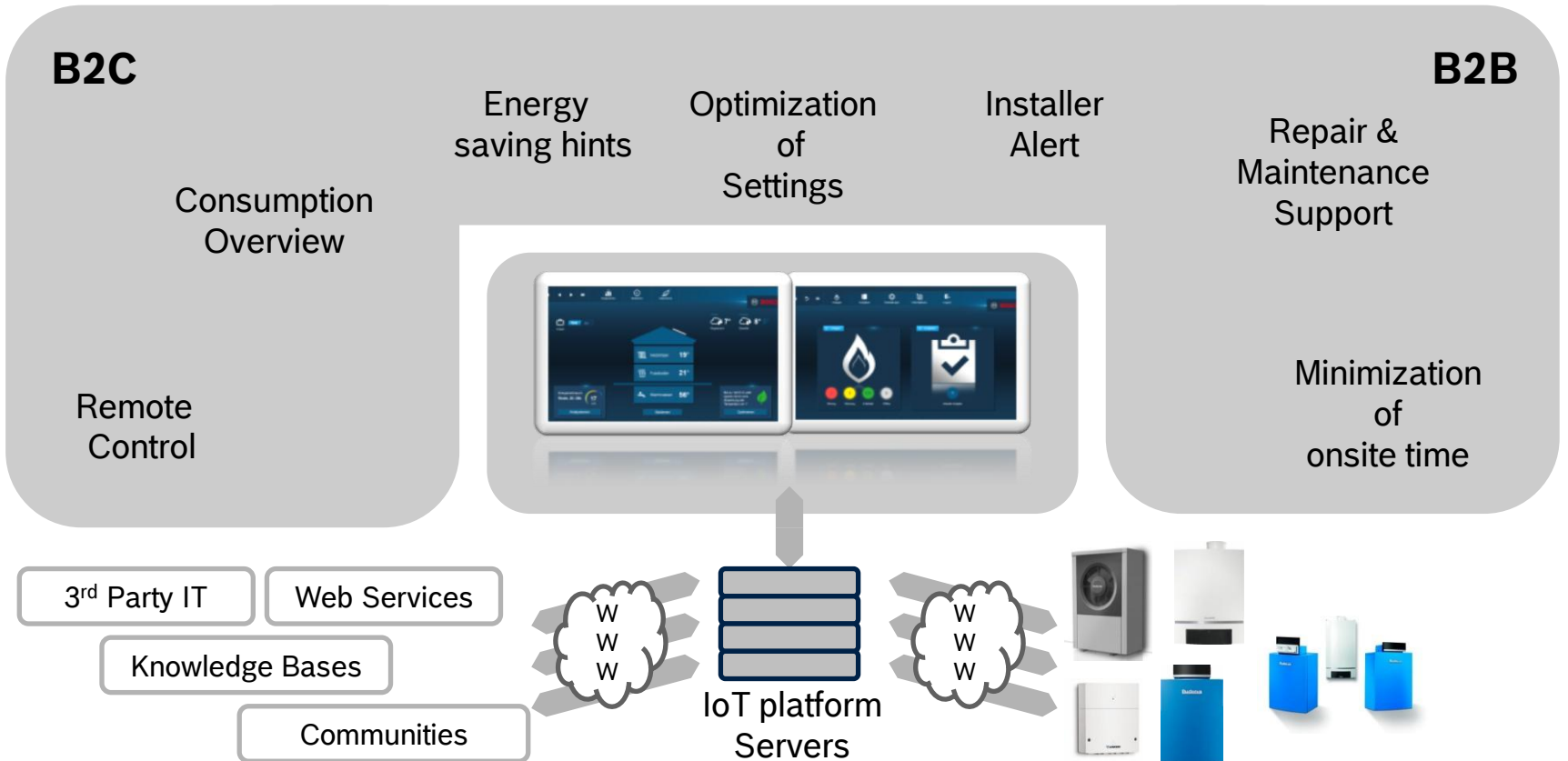


During period of high price the Heat Pump works less.

**Flexible tariffs combined with webservices enable smart control for heat pumps**

# What does a Smart Home of the future look like ?

## Example: Connected Products Portal



**Internet of Things platform enables new energy related functions for end customers (B2C) and installers (B2B)**

# What does a Smart Home of the future look like ?

## Conclusions

→ **Residential Smart Homes will become reality in the near future**

→ **Technologies and solutions are available to support energy efficiency**

- Internet of Things technology and platforms support data exchange down to single devices
- Communication standards at interfaces => Initiatives exist !
- Data storage and processing technology => Security & Transparency is a must !
- Smart devices, appliances and services

→ **Boundary conditions need to be improved to lever the full potential of smart homes for energy efficiency**

- Implement 2030 energy efficiency target
- Put the prosumer in the center
- Introduce flexible tariffs
- Enhance demand side management
- Integrate storage

**Ambitious “New Deal for Energy Consumers” needed**

