

Session F:

What are the opportunities for natural gas in homes and businesses of the future

Motivation and drivers of a German gas utility to support
mCHP / fuel cells

overview about E.ON Ruhrgas' engagement in lab & field trials

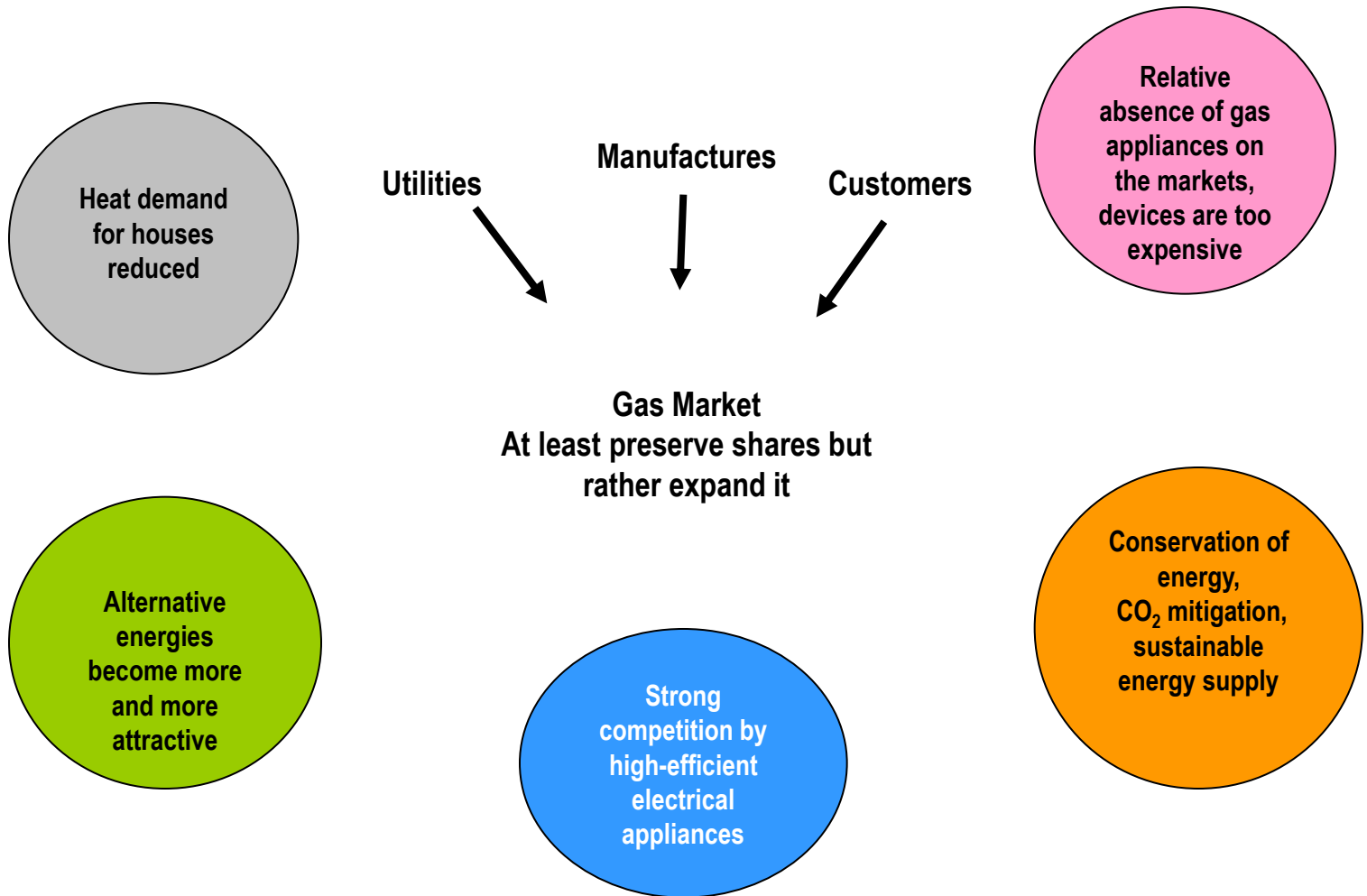
19th October 2011, Seoul

Dr. Martin Wilmsmann, E.ON Ruhrgas AG, Germany

Content of presentation

- Boundary conditions in heating markets
- Interests of players involved in energy debate
- different roles energy suppliers could play to create value
- EON Ruhrgas' role and engagement in innovative technologies

Boundary conditions in heating markets



Triple win situation

.....reflecting the interests of.....

Government

- Transposing Kyoto targets
- Securing fuel & energy supply
- Create new markets, global export
- Strengthen competitiveness of country
- Establish high tech competencies
- Sustaining existing / creating new jobs

OEM

- Enlarging product portfolio, new product line
 - to stand out from competitors
 - to underpin Company philosophy standing for innovation, careful use of resources, efficient energy use
- Bridging innovation gap

Utility

- Advantages of own business extract value from supply chain
- Acquisition of new customers
- Customer retention
- Demonstrate commitment to CO2 reduction aims
- Correct image

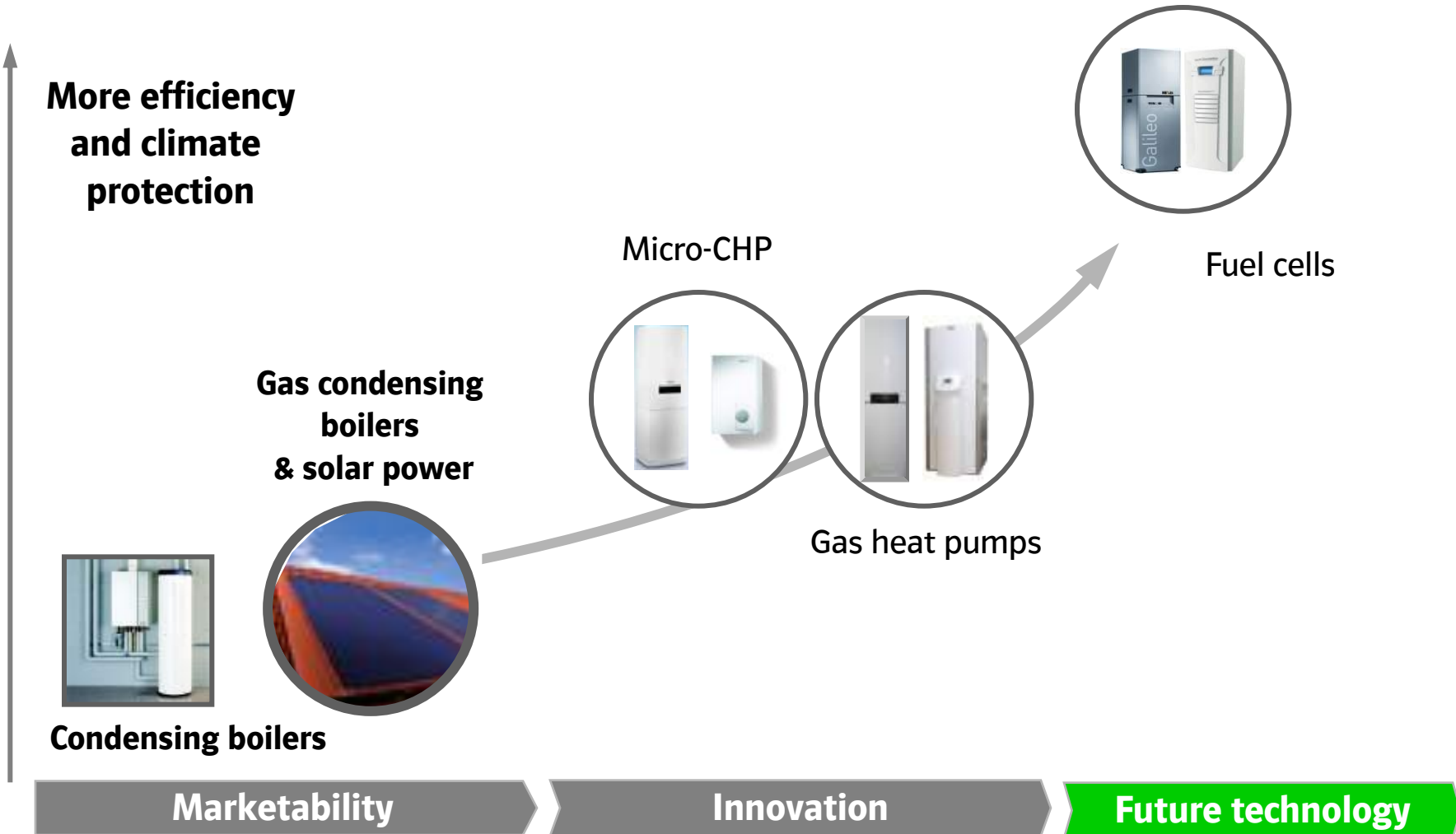


Common approach

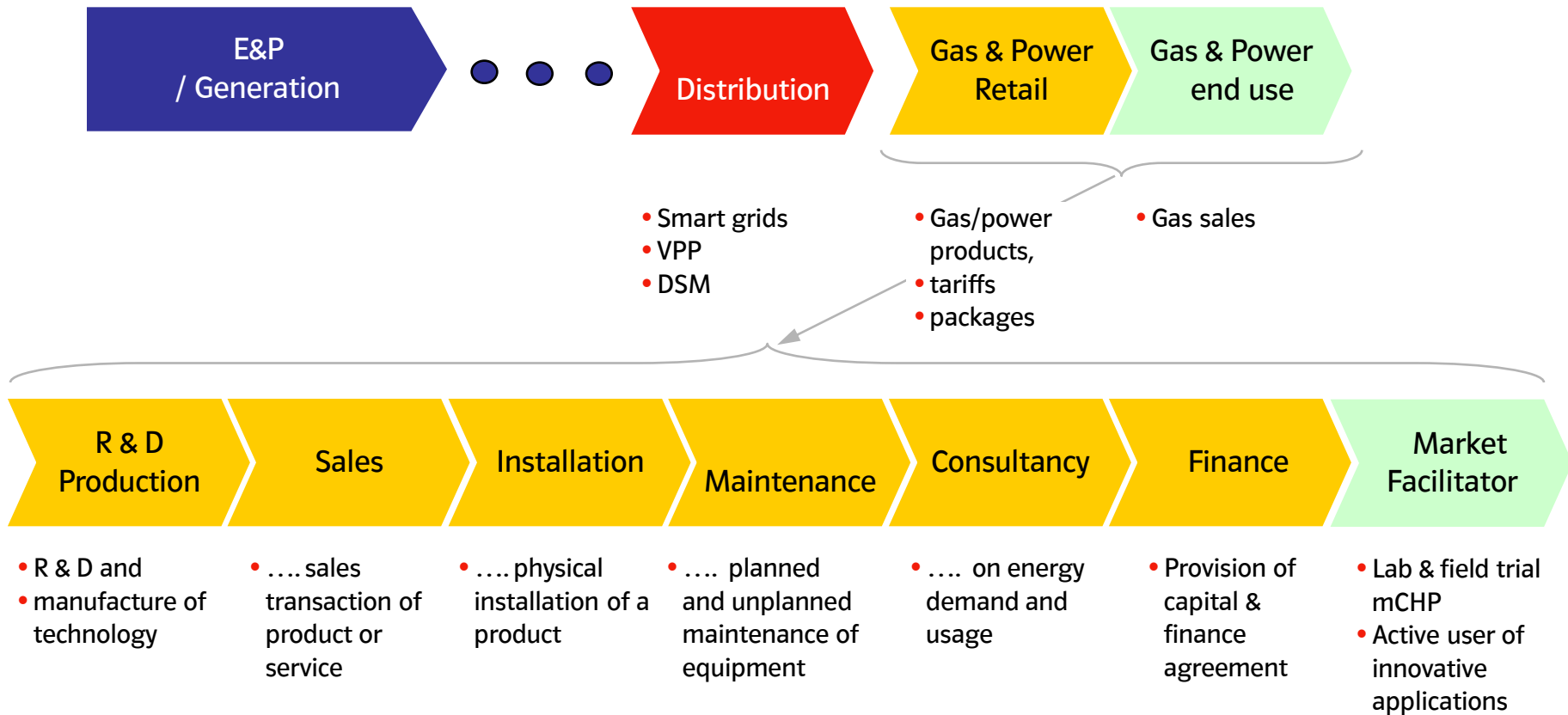


Development & marketing
 of
 new technologies for new markets

Heat market innovation pathway



Number of ways for energy suppliers to secure value from the value chain Power & Gas



EON Ruhrgas' engagement


Market
Facilitator

Largest mCHP & fuel cell
heating appliance field tests
throughout Germany

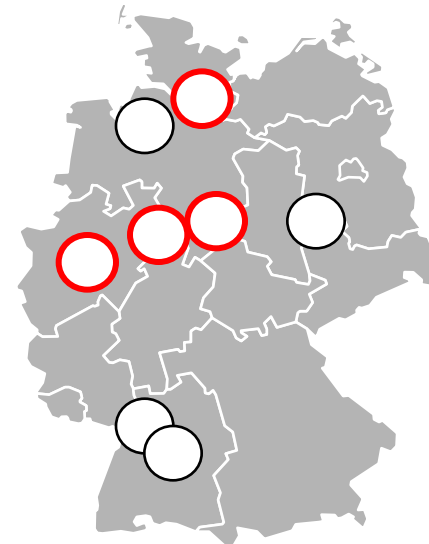


mCHP User Group
(stirling and ICE)

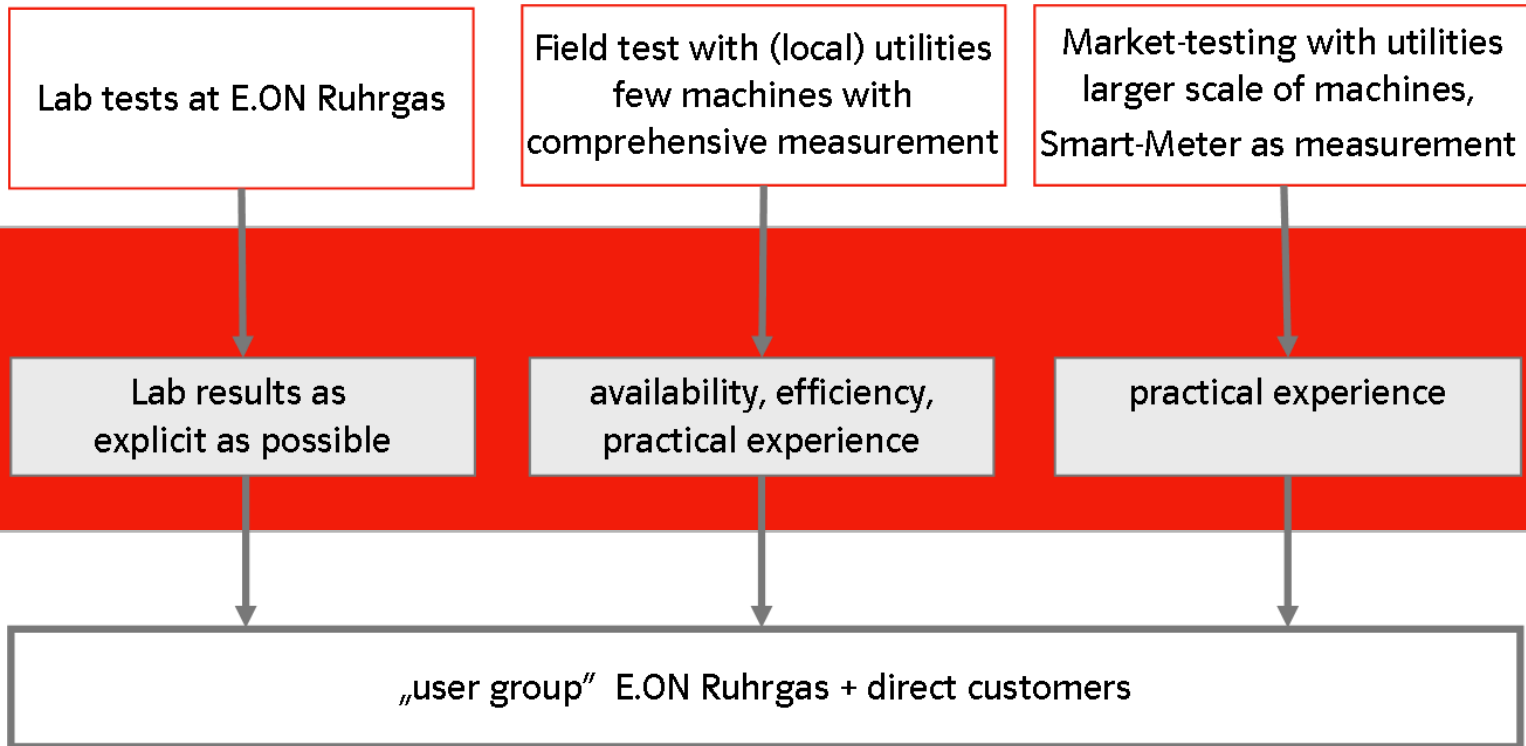
Callux Lighthouse Project
(fuel cells)



Callux (nip)
Präsident Brennstoffzelle für Eigenheim
Ein Projekt der Industriellen Vereinigung
Mittelstand und Brennstoffzellentechnologie



Three step approach for innovation support mCHP User group



mCHP user group at a glance

mCHP user group

- **user group mCHP:**
broad based field and demonstration tests of mCHPs
- **objectives:**
exchange of experience e.g. current status of development and operation of mCHP`s
- Upfront to the „user group“ a decade of different lab- and field tests put the basis for experienced assessments

Cooperation with local utilities und manufacturer

- 51 customers of ERG (local utilities and E.ON distribution companies) are participating



DEW21

Stadtwerke Essen AG



STADTWERKE
RINTELN



- All major heating appliance manufacturer are participating

Buderus



VIESSMANN
climate of innovation

De Dietrich Remeha



Within 3 years 200 mCHP`s installed in real single family houses shall be tested by E.ON and its partners

Overview of current technical developments (stirling / ICE)

Core technologies & system integrators

Honda ICE	Kirsch ICE
 <p data-bbox="691 548 909 733">Available on market</p> <p data-bbox="635 868 755 905">Vaillant</p>	 <p data-bbox="1045 868 1141 905">Kirsch</p>

WhisperGen Stirling



Available on market

ehe - 2G-home, Sanevo

Microgen Stirling-Motor

 <p data-bbox="761 976 973 1162">Available on market</p>		 <p data-bbox="1224 976 1437 1162">Available on market</p>		
Viessmann	Brötje	Remeha	Senertec	Vaillant

Callux – Fuel Cell Lighthouse project as part of NIP



Public Private Partnership

- Government \approx 500 Mill. €
- Industry \approx 500 Mill. €

10
years

for R & D Programmes in

- mobile
- domestic
- industrial
- special

fuel cell markets



Aims of

Test in field under real conditions

to identify the potential of further technical improvements



Prepare market for natural gas-based fuel cells

- Demonstration and support of further development of durability to marketable products
- Development of the supply chain by binding orders of large numbers of plants
- Enhancement of the publicity notice
- Further development of concepts to integrate fuel cells into the infrastructure
- Education of craftsmen and designers
- Validation of customer and market requirement



Members of Callux consortium

Energy Suppliers



Light House Project



Fuel Cell Manufacturers