



solutions for europe

natural refrigerants

16-17 March 2015 in Brussels

CHALLENGES and DRIVERS

Industrial refrigeration & heat pumps

ERIC DELFORGE

Corporate Business & Policy Officer
MAYEKAWA EUROPE

CHALLENGES and DRIVERS





CHALLENGES and DRIVERS
Industrial Refrigeration & Heat Pumps

Today's EU context



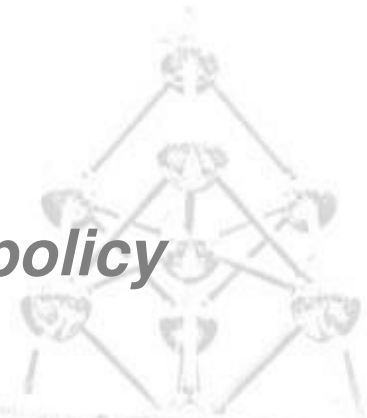
Today's EU context

EU Carbon Energy security debate



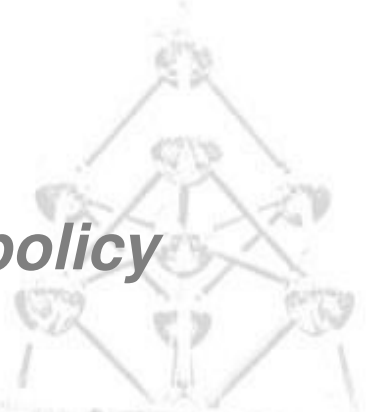
Today's EU context

EU Carbon Energy security debate
EU Electricity production & distribution policy



Today's EU context

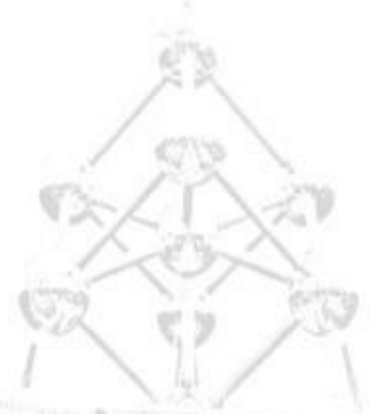
EU Carbon Energy security debate
EU Electricity production & distribution policy
Paris climate top & CO2 emissions



Today's EU context

EU Carbon Energy security debate
EU Electricity production & distribution policy
Paris climate top & CO2 emissions
EU F-gas kick-off effect worldwide

The end-users perspective





The end-users perspective

Taxation threads on CO2 emissions

The end-users perspective

Taxation threads on CO2 emissions
Customer demand for Sustainability & Accountability



The end-users perspective

Taxation threads on CO2 emissions
Customer demand for Sustainability & Accountability
High operational requirements



Technology providers



Technology providers

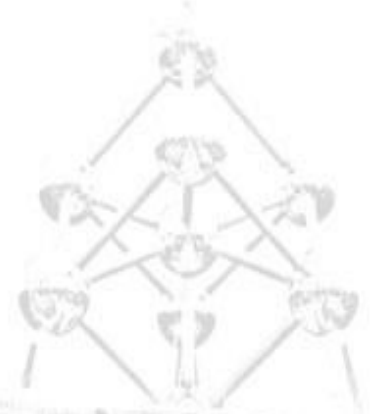
More players



Technology providers

More players

Increased variety of applications

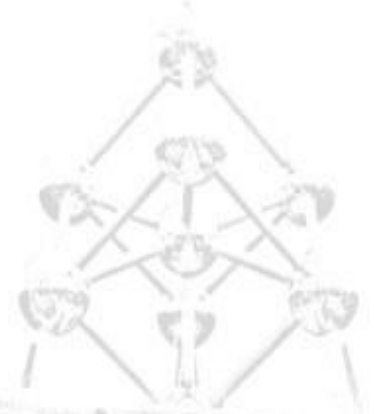


Technology providers

More players

Increased variety of applications

More equipment availability



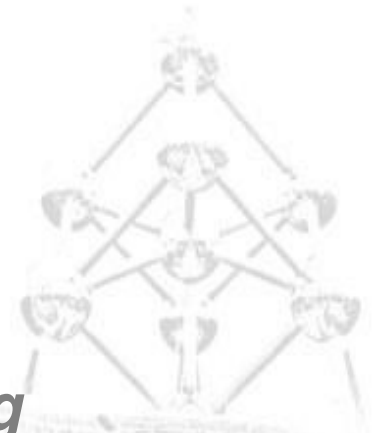
Technology providers

More players

Increased variety of applications

More equipment availability

Capital cost decreasing



Technology providers

More players

Increased variety of applications

More equipment availability

Capital cost decreasing

Increased accessibility



Technology providers

More players

Increased variety of applications

More equipment availability

Capital cost decreasing

Increased accessibility

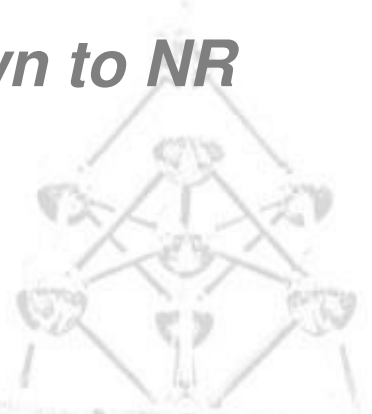
Less complexity

Newcomers



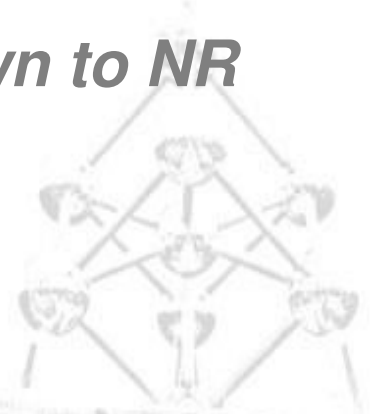
Newcomers

Small & medium sized contractors are drawn to NR



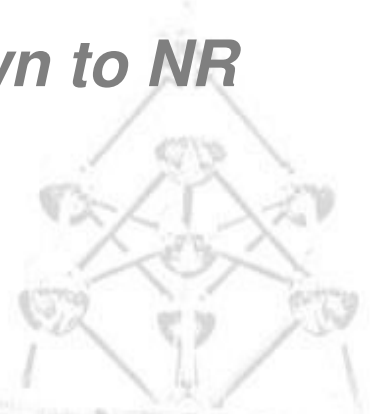
Newcomers

*Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :*



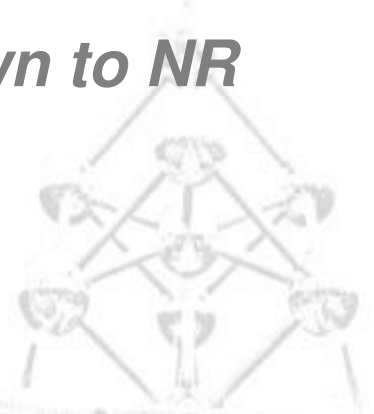
Newcomers

*Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :
Equipment*



Newcomers

*Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :
Equipment
Refrigerants*



Newcomers

*Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :
Equipment
Refrigerants
Legislation*

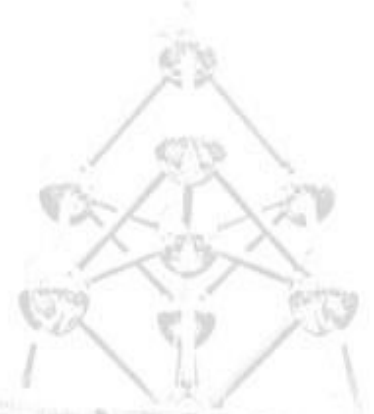
Newcomers

***Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :
Equipment
Refrigerants
Legislation
'Controlled Environment'***

Newcomers

*Small & medium sized contractors are drawn to NR
Inexperienced with NRBT :
Equipment
Refrigerants
Legislation
'Controlled Environment'
Responsibilities*

Key factors



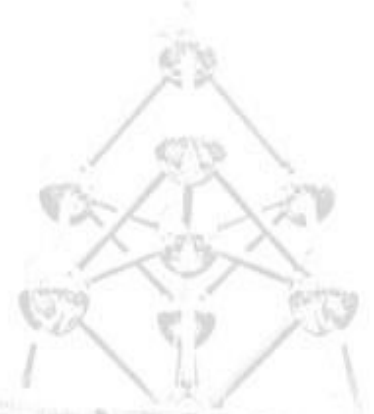
Key factors

Component manufacturers:



Key factors

*Component manufacturers:
Enhance & ensure safety*



Key factors

*Component manufacturers:
Enhance & ensure safety*

Consultants & contractors:



Key factors

*Component manufacturers:
Enhance & ensure safety*

*Consultants & contractors:
Benchmark NRBT*



Key factors

*Component manufacturers:
Enhance & ensure safety*

*Consultants & contractors:
Benchmark NRBT*

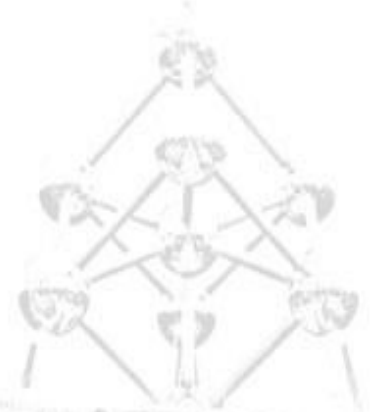
Governing bodies & sector organizations :

Key factors

*Component manufacturers:
Enhance & ensure safety*

*Consultants & contractors:
Benchmark NRBT*

*Governing bodies & sector organizations :
Inform, train & control*



Key factors

*Component manufacturers:
Enhance & ensure safety*

*Consultants & contractors:
Benchmark NRBT*

*Governing bodies & sector organizations :
Inform, train & control*

Universities



solutions for europe
natural refrigerants

16-17 March 2015 in Brussels



Challenges and drivers
Industrial refrigeration & heat pumps

Challenges





solutions for europe

natural refrigerants

16-17 March 2015 in Brussels



Challenges and drivers
Industrial refrigeration & heat pumps

Challenges

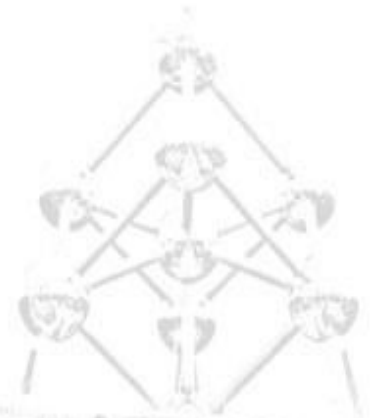
Miniuritazation



Challenges

Miniuritazation

Design inovations :

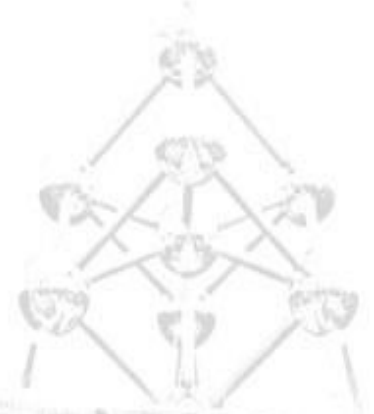


Challenges

Miniuritazation

Design inovations :

- operational simplification*
- Reliability and safety :*



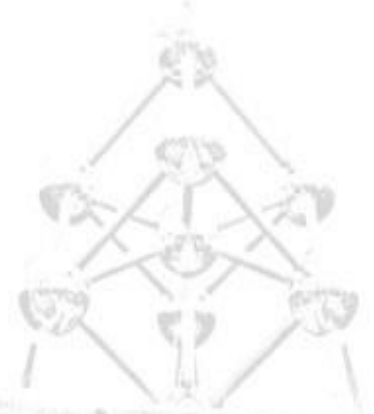
Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :



Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :

- *Inovative heat exchangers*
- *Cascade systems*

Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :

- *Inovative heat exchangers*
- *Cascade systems*

Eliminate leakage :

Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :

- *Inovative heat exchangers*
- *Cascade systems*

Eliminate leakage :

- *Semi-hermetic systems*

Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :

- *Inovative heat exchangers*
- *Cascade systems*

Eliminate leakage :

- *Semi-hermetic systems*

Energy efficiency :

Challenges

Miniuritazation

Design inovations :

- *operational simplification*
- *Reliability and safety :*

Minimalize Refrigerant charge :

- *Inovative heat exchangers*
- *Cascade systems*

Eliminate leakage :

- *Semi-hermetic systems*

Energy efficiency :

- *Inclusive systems*
- *Flexible seasonal and load operation*



solutions for europe

natural refrigerants

16-17 March 2015 in Brussels

Ammonia chiller

Semi-hermetic piston

PM motor

Ultra -low refrigerant charge



Challenges and drivers
Industrial refrigeration & heat pumps



Ammonia-CO2 cascade chiller
Compound 2stage ammonia compressor
Semi-hermetic PM motor
Ultra -low refrigerant charge

NewTon 3000 Modular Skid

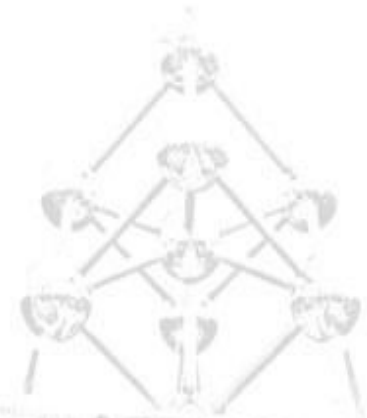


Policy themes



Policy themes

Decarbonization



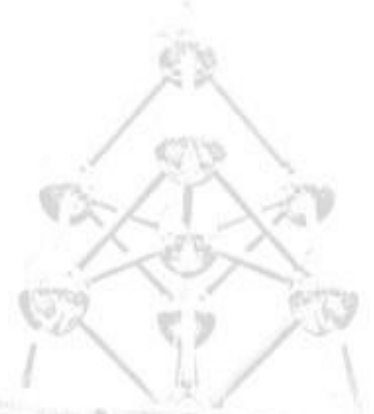
Policy themes

Decarbonization
Long-term energy & climate goals



Policy themes

Decarbonization
Long-term energy & climate goals
Energy efficiency



Policy themes

Decarbonization
Long-term energy & climate goals
Energy efficiency
Intelligent networks



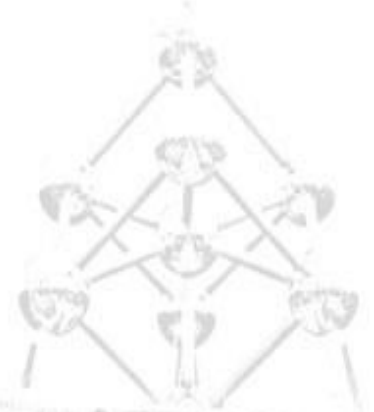
Policy themes

Decarbonization
Long-term energy & climate goals
Energy efficiency
Intelligent networks
Smart cities



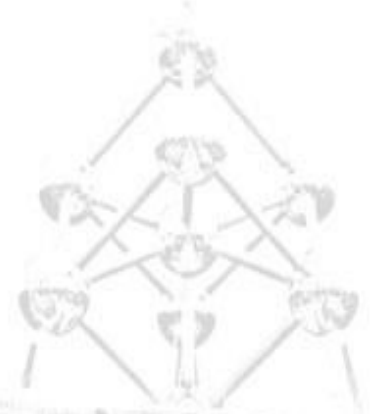
Policy themes

Decarbonization
Long-term energy & climate goals
Energy efficiency
Intelligent networks
Smart cities
Renewal energy storage





EU policy



EU policy

EU Heating and Cooling conference

<http://ec.europa.eu/energy/en/news/heating-and-cooling-conference-26-27-february>

EU policy

EU Heating and Cooling conference

<http://ec.europa.eu/energy/en/news/heating-and-cooling-conference-26-27-february>

A lot about heating

EU policy

EU Heating and Cooling conference

<http://ec.europa.eu/energy/en/news/heating-and-cooling-conference-26-27-february>

A lot about heating and cooling

EU policy

EU Heating and Cooling conference

<http://ec.europa.eu/energy/en/news/heating-and-cooling-conference-26-27-february>

heating

cooling

EU policy

EU Heating and Cooling conference

<http://ec.europa.eu/energy/en/news/heating-and-cooling-conference-26-27-february>

*heating **and** cooling ?*

Inclusive technology



Inclusive technology

Integrated and cross border energy supply & security





solu
natu

16-17

umps

Local & Cross-sector collaboration / integration





Local & Cross-sector collaboration / integration

Singular/exclusive core business focus



EUR

solu

natu

16-17

umps

Local

ation

New Inclusive business models





solu

natu

16-17

umps

Local

tion

New Inclusive business models

Local Thermal energy networks & storage



solu

natu

16-17

umps

Local

ation

New Inclusive business models

*Local Thermal energy networks & storage
Industry & community intergration*



solutions for europe

natural refrigerants

16-17 March 2015 in Brussels

ΜΑΥΕΚΑΨΑ
MYCOM

Challenges and drivers
Industrial refrigeration & heat pumps

Industrial refrigeration and heat pumps

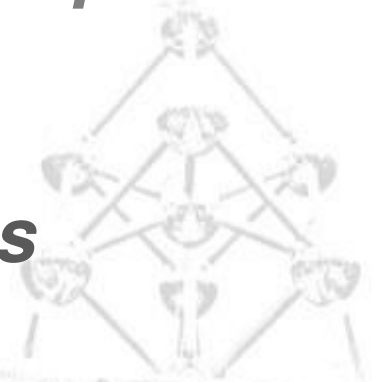




Industrial refrigeration and heat pumps
Cooling and heating

Industrial refrigeration and heat pumps
Cooling and heating

Inclusive Carnot cycle solutions



*Industrial refrigeration and heat pumps
Cooling and heating*

*Inclusive Carnot cycle solutions
with
Natural Refrigerant Based Technology*



*Industrial refrigeration and heat pumps
Cooling and heating*

*Inclusive Carnot cycle solutions
with
Natural Refrigerant Based Technology*





solutions for europe

natural refrigerants

16-17 March 2015 in Brussels

Thank you very much!