EiiF Presentation

TIPCHECK Experience

POTENTIAL ENERGY SAVINGS IN EUROPE USING INSULATION

First lessons from industrial energy audits

www.eiif.org

The EiiF Foundation

- EiiF was established in 2009 by **8 Founding Partners** as a non-profit Foundation.

- Nowadays, it comprises **more than 60 leading** industrial insulation companies from global player size to small and medium-sized companies.

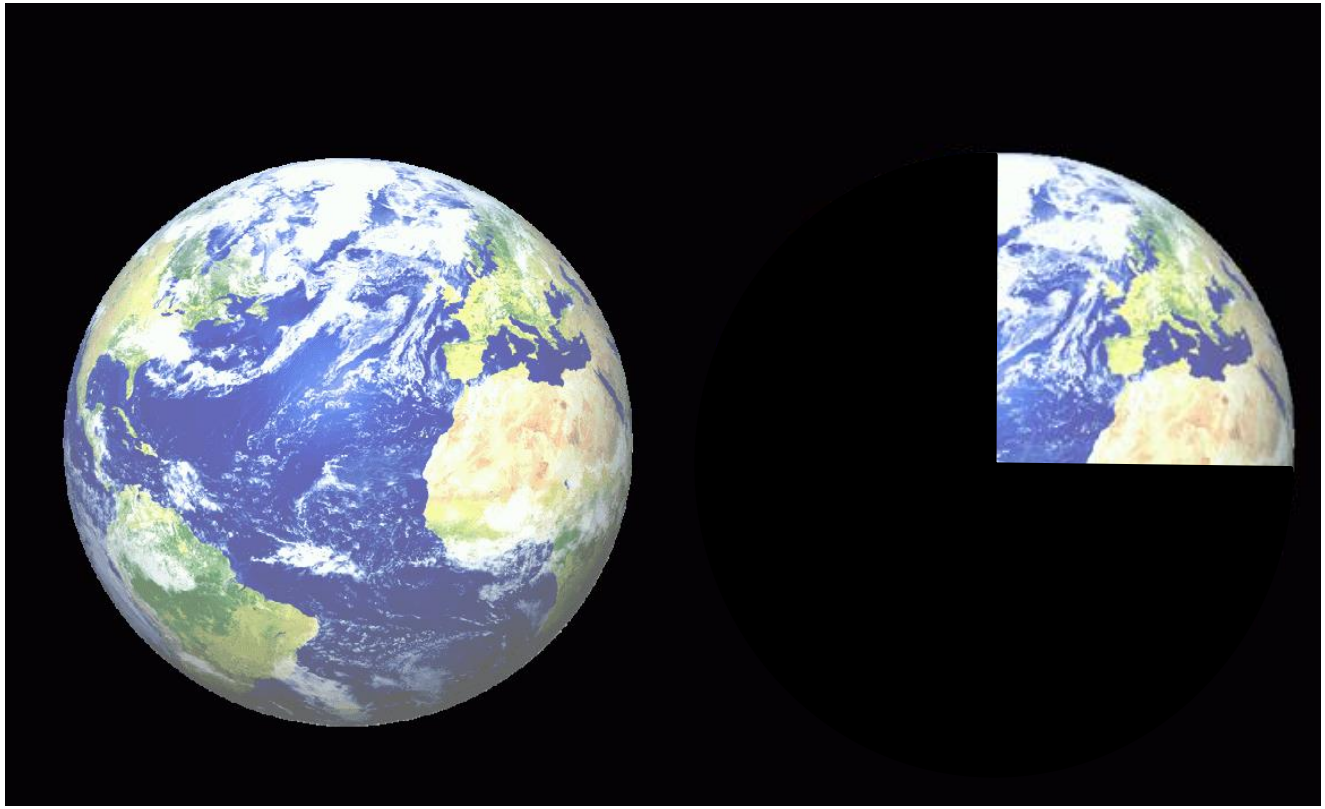
Future Challenges?

2010:

we were consuming roughly

1.25 earth's

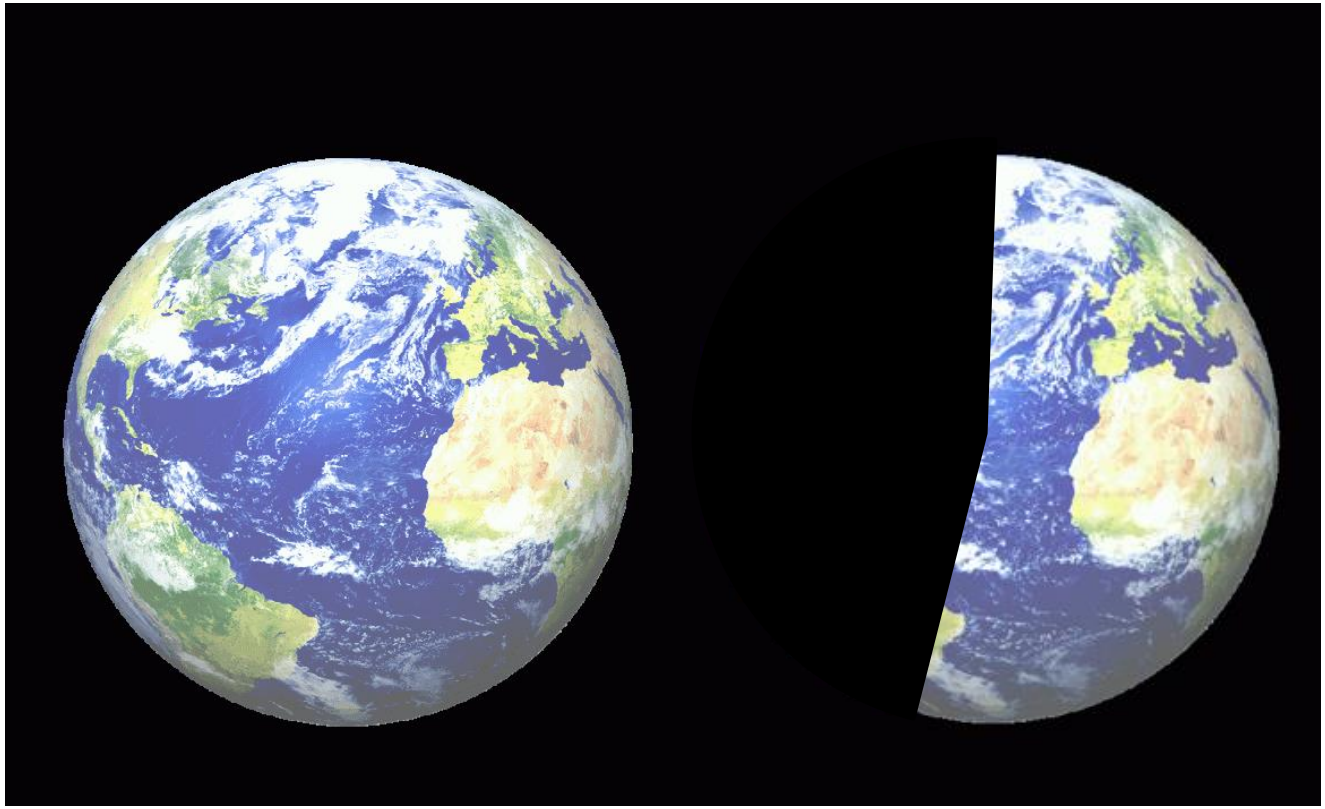
worth of resources.



Future Challenges?

Today humanity already uses the equivalent

of 1.6 planets.

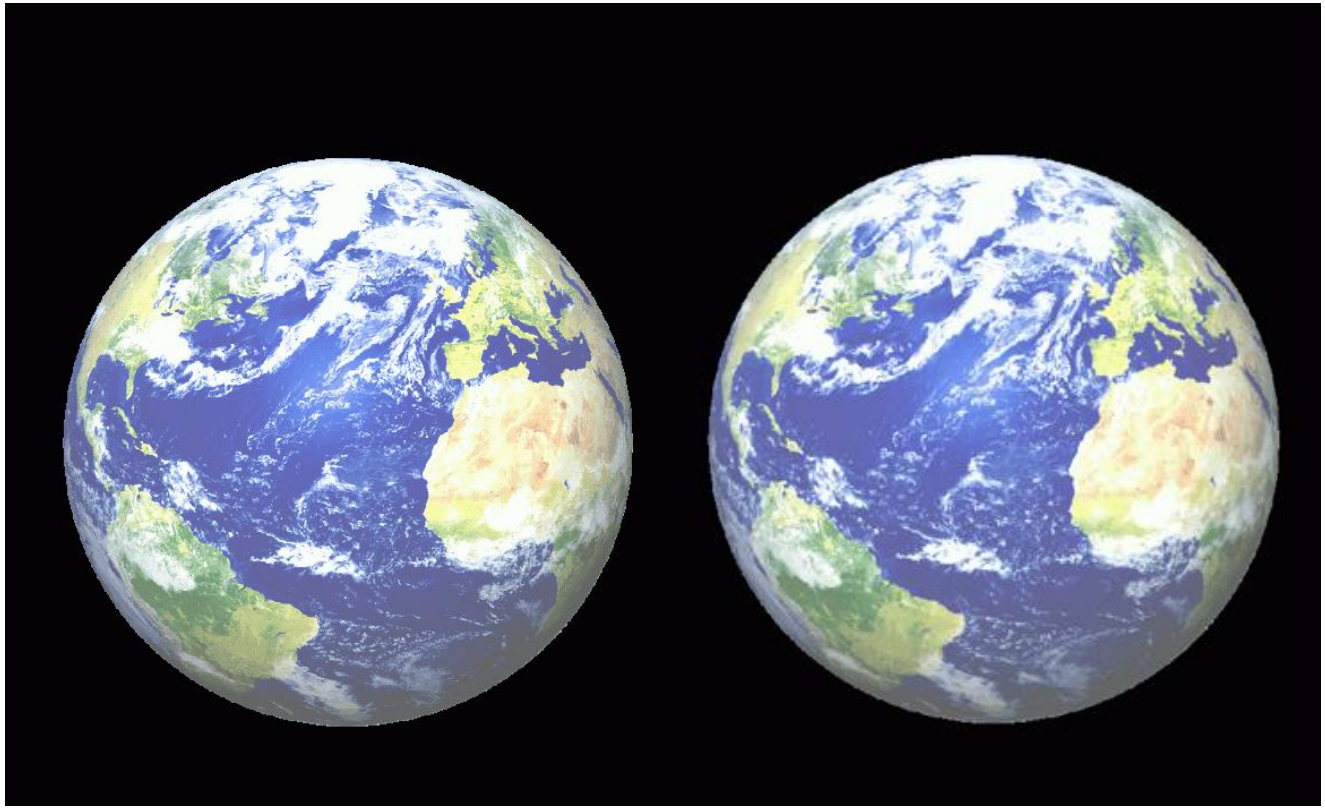


Source: http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/

Future Challenges?

- Moderate UN scenarios suggest that if current population and consumption trends continue, by the **2030s**, we will need the **equivalent of two Earths.**

- If China consumes at the rate that the US population does (2010), we need **two new earths just for Chinese consumers**.



Source: http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/

Why Energy Audits

The Challenge:

We need to learn how to use less and therefore have to learn how to produce more from less.

Article 8/EED:

Energy audits and energy management systems

1. Member States shall promote the availability to all final customers of high quality energy audits which are cost-effective […]

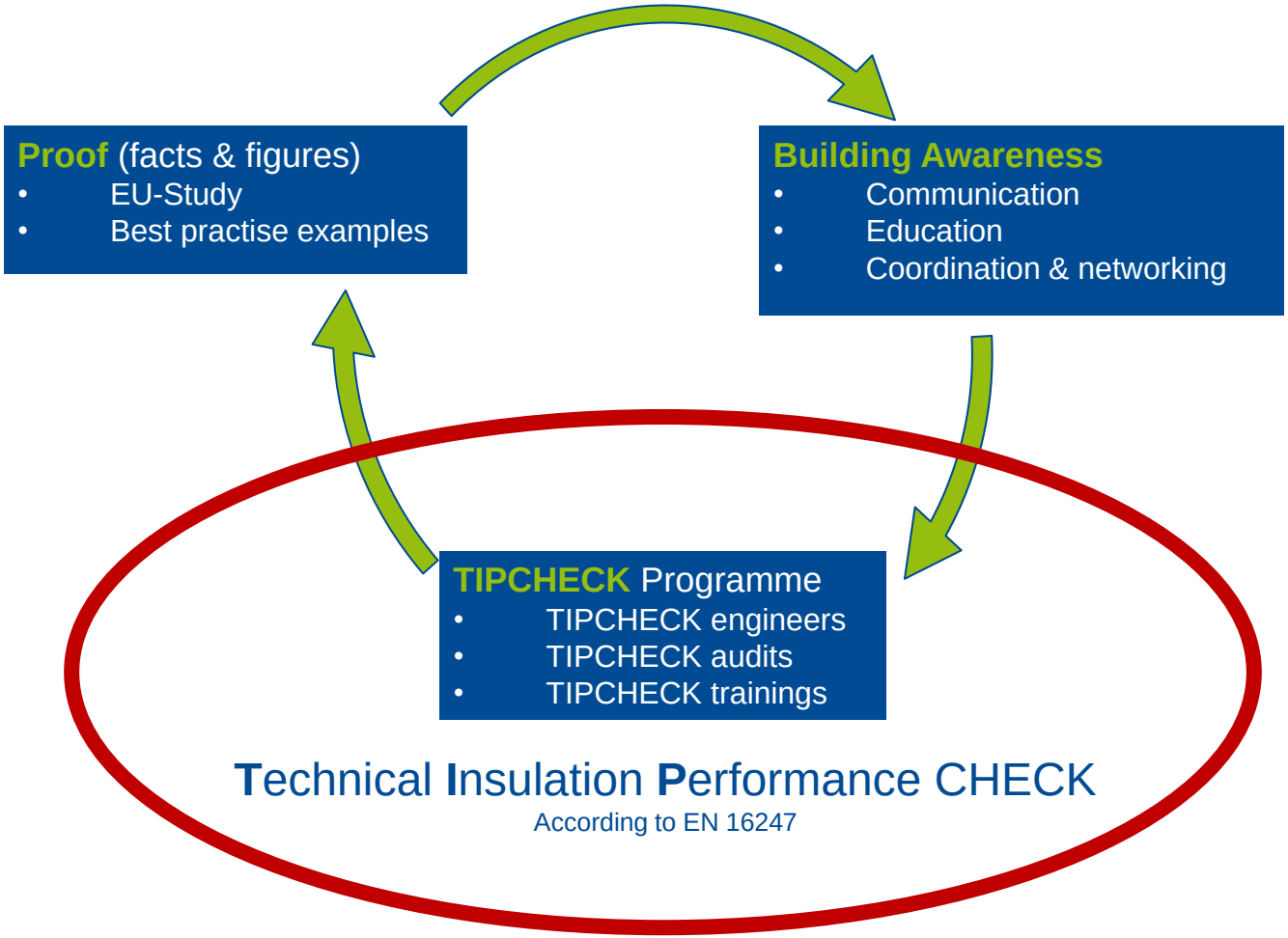
Why Energy Audits Specialised on Industrial Insulation

Industrial insulation is a cross-cutting technology offering Multiple Benefits:

- ✓ Reduces Safety Risks for Personnel and Equipment
- ✓ Improves Working Environments
- ✓ Increases Energy Efficiency
- ✓ Reduces Emissions
- ✓ Improves Process Efficiency
- ✓ Improves Competitiveness

- ✓ **Reduces Costs**

The EiiF Strategy Building on a Spiral Development



TIPCHECK Case Study #1- Refinery

Refinery – Oil Storage tank roof 60 °C

Key facts:

- Very old and damaged insulation inside the tank roof

- Huge CUI problems - sheets of the roof heavily corroded
- Need for the client to replace it
- **BUT:** The owner considered to rebuild the roof without any insulation as he wanted to avoid CUI problems in the future.

TIPCHECK Case Study #1- Refinery

Refinery – Oil Storage tank roof 60 °C

- **TIPCHECK result:** Without insulation the energy loss would be **~9,500 MWh / € 430.0000** per year.

- An insulation of only 30 mm thickness on the roof, applied with a technical solution which helps to avoid future CUI problems, **reduces the energy loss by 80%** offering a **payback time of less than 2 years**.

TIPCHECK Case Study #1- Refinery

Refinery – Oil Storage tank roof 60 °C

- **TIPCHECK result:** Without insulation the energy loss would be **~9,500 MWh / € 430.0000** per year.

Final decision: the owner decided to insulate the new roof

- An insulation of only 30 mm thickness on the roof, applied with a technical solution which helps to avoid future CUI problems, **reduces the energy loss by 80%** offering a **payback time of less than 2 years**.

TIPCHECK Case Study #2 : Chemical Plant

Chemical Plant:

Key facts:

- Flanges and valves not insulated
- Old and damaged insulation partly in place.
- TIPCHECK scope:
  - ✓ Identify the saving potential of un-insulated parts and analyze the remaining performance of old and damaged insulation

TIPCHECK Case Study #2 : Chemical Plant

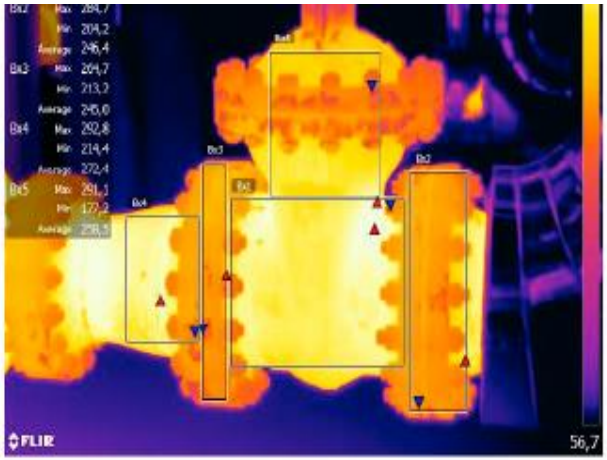
Key Findings:

- **650 m** of piping with missing or damaged insulation
- **300** un-insulated pairs of flanges
- **160** un-insulated valves
- **3** un-insulated tanks
- Process temperature range: from **75 °C**/170 °F to **150 °C**/300 °F
- Savings potential: **11.100 MWh/year & € 200.000/year**
- CO2 emission reduction potential: **2.240 ton/year**
- **Payback time less than 1 year**

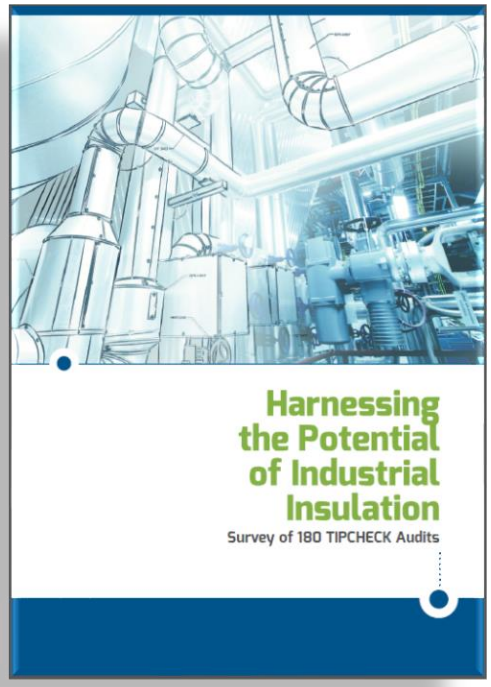
TIPCHECK Case Study #3

Focus on a very often un-insulated high temperature valve

- 12' **un-insulated valve**
- Process temperature: **260 °C**/500 °F
- Savings potential: **114 MWh/year**
- CO2 emission reduction potential: **51 ton/year**
- **Payback time less than 1 year**



Lessons learnt: Evaluation of 180 Thermal Energy Audits



- TIPCHECK – Thermal Energy Audits
  - ➢ Technical Insulation Performance Check
- Survey of 180 energy audits at 180 industrial plants
- Publication: May 2016 (already in its 2nd Edition)
- Download on www.eiif.org

Lessons learnt: Delivering Multiple Benefits Everywhere

The “First Lesson Learnt” from our 180 TIPCHECK Audits in the same number of plants in Europe and abroad:

The savings potential exists across all:

- ✓ Regions
- ✓ Sectors
- ✓ Equipment
- ✓ Operating temperatures

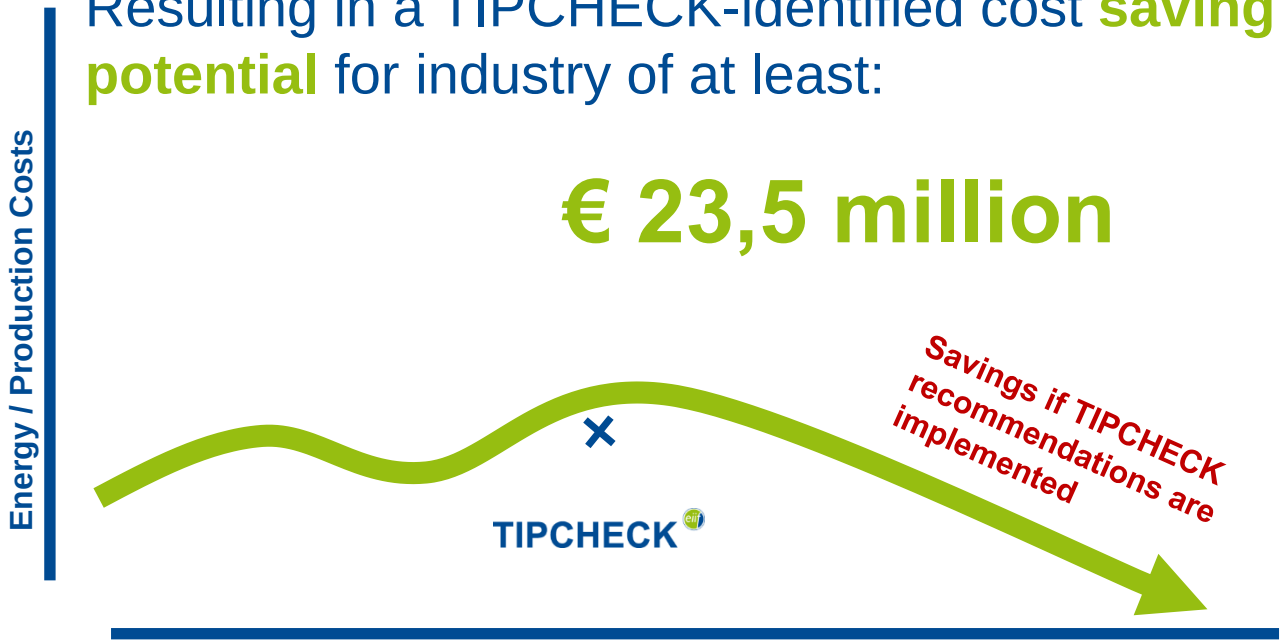
Lessons learnt: 180 TIPCHECKs – The Results at a Glance

The annual energy savings potential identified was:	**> 750.000 MWh/year (2,7 PJ/year)**
Resulting in an estimated **CO_2 emission reduction** potential of:	**> 500.000 t CO_2**
Equivalent to the annual **greenhouse gas emissions** of almost:	~ **110.000 cars.**

180 TIPCHECK – The Results at a Glance

Resulting in a TIPCHECK-identified cost **saving potential** for industry of at least:

€ 23,5 million



180 TIPCHECK - The Results at a Glance

After a TIPCHECK audit:

- **<u>3 out of 4</u>**

➢ (**75%**) industrial **clients** have either already **invested or plan to invest in the near future** (for example, at the next turnaround) **in insulation** to remediate existing insulation deficiencies.

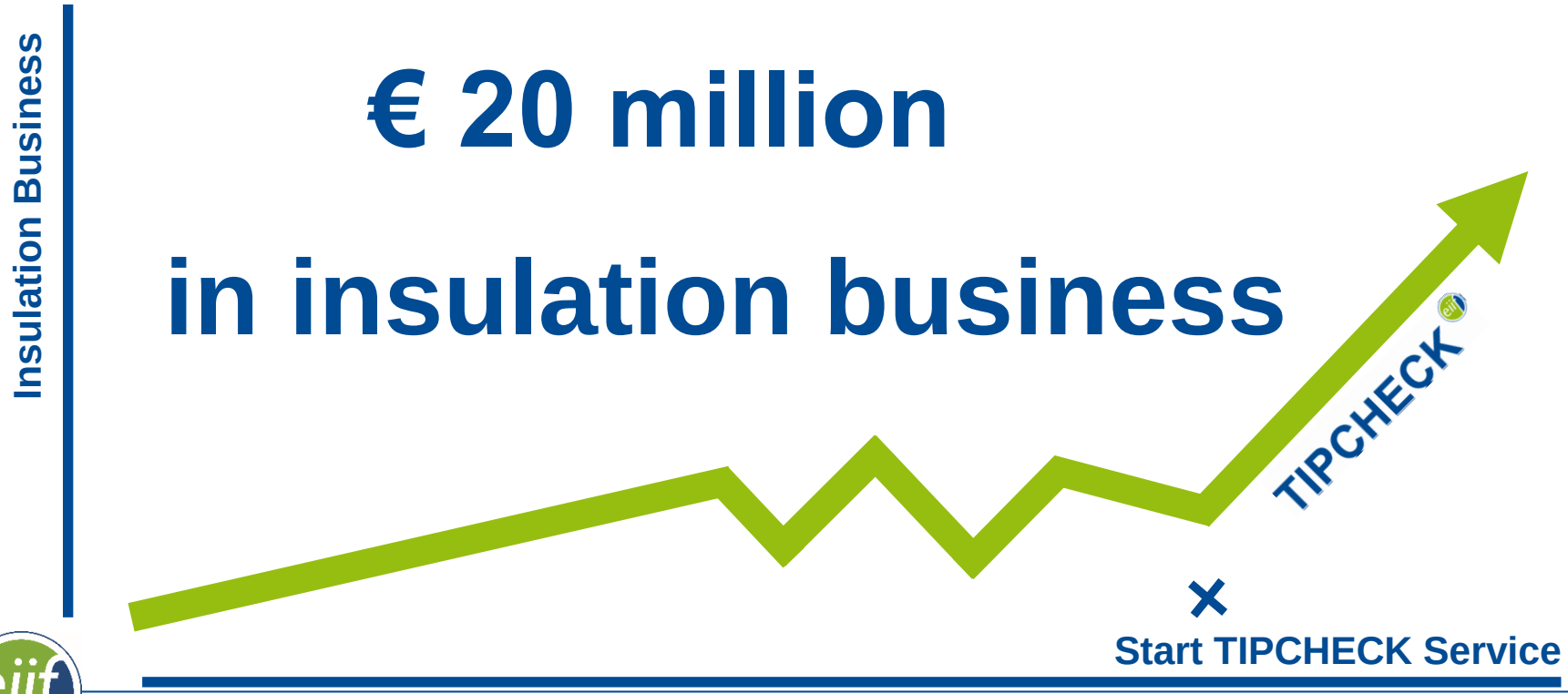
180 TIPCHECK - The Results at a Glance

- Based on the implementation rate (55% have implemented 100%, 13% have implemented parts, and 14% are considering implementation),

The TIPCHECK programme has already resulted in annual **energy savings** of:	**> 500.000 MWh/year => (*1,8 PJ/year*)**
Resulting in an estimated **CO_2 emission reduction** of:	**> 370.000 t CO_2**
Equivalent to the annual **greenhouse gas emissions** of:	~ **80.000 cars.**

TIPCHECK - The results at a glance

Implemented insulation improvements resulting from the first **119** realised TIPCHECK audits (68% of all TIPCHECK audits) **represent**



Lessons learnt: Audits Help to Tap “Hidden Potentials”

- Typical reaction after a first facility walkthrough of a TIPCHECK client:

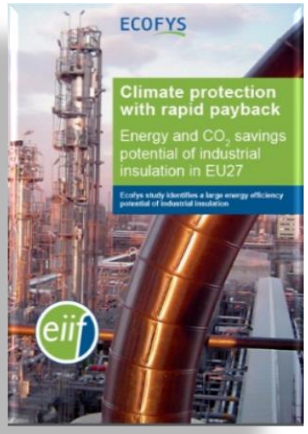
  “You don’t know, what you don’t know, until you know”

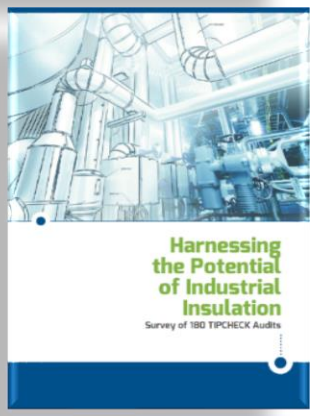
- TIPCHECK clients are **not necessarily and always aware, how much energy they are wasting.**

- They usually are **not aware how easy and quick** it is to **stop the energy waste** with properly **insulated** systems/installations.

- Energy is **not the core business** of most industrial players but a necessary means to manufacture their products – whatever it is...

Future Challenges: Ecofys EU Study (2012)





The annual cost-effective savings potential is
620 PJ

=

The Energy consumption of 10 million households

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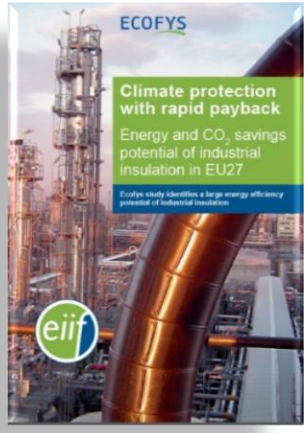
180 TIPCHECKS

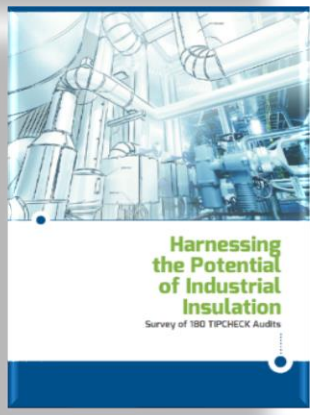
Realised with a success rate of 75% annual cost-effective savings of

=

1,8 PJ/year

The Future Challenge for TIPCHECK





Lessons learnt:

<u>100 TIPCHECKs realise ~ 1 PJ</u>

To realise the 620 PJ we will need to carry out:

<u>62’000 TIPCHECKS</u>

!

Future Challenges

- **Only 1,8 PJ of the energy saving potentials** were realised from the **2,7 PJ** identified in the first 180 TIPCHECKs
- **0,9 PJ = 1/3** of the total identified potential is **not being tapped** by industry despite being cost-effective to implement

Advocacy Activities of EiiF

- **Article 8 of the Energy Efficiency Directive needs to be improved:**
  - Combining the energy audit obligation with
    - **a mandatory requirement** and
    - **incentives**

    to implement recommended improvements which are possible through existing technologies that offer short payback periods of less than 3 years.

  - **Incentives could furthermore be linked to an ambitious timeframe of 1-2 years** in which the identified energy saving potentials shall be realised **in connection with the next planned maintenance**.
  - Member States should continue to develop national programmes* **to assist SMEs with an intensive energy use above a defined level** to undergo energy audits and to consequently implement the recommendations at their next available opportunity.

*(including soft loans, fiscal and other State Aid rule compliant incentives,)

Advocacy Activities of EiiF

- **Why?**

  - An energy audit without the obligation to tap the identified energy saving potentials doesn't necessarily lead to energy savings.
  - TIPCHECK experience shows that **one third of the identified potentials remain untapped despite being cost-effective**.
  - A mandatory requirement to take action within an ambitious timeframe with the support of incentives will **make energy performance improvements a high priority** leading to improved energy productivity and increased competitiveness of Europe's industry.

Advocacy Activities of EiiF

- ✓ **Without mandatory requirements** to take action to tap the audited energy efficiency potentials,
- ✓ **Without the extension of energy audits to SMEs** with an intensive energy use,
- ✓ **Without encouraging programmes and incentives** to do this **in an ambitious timeframe**…

…We fear that large parts of the (cost-effective) energy efficiency potentials in Europe's industry **will remain untapped**.

Advocacy Successes

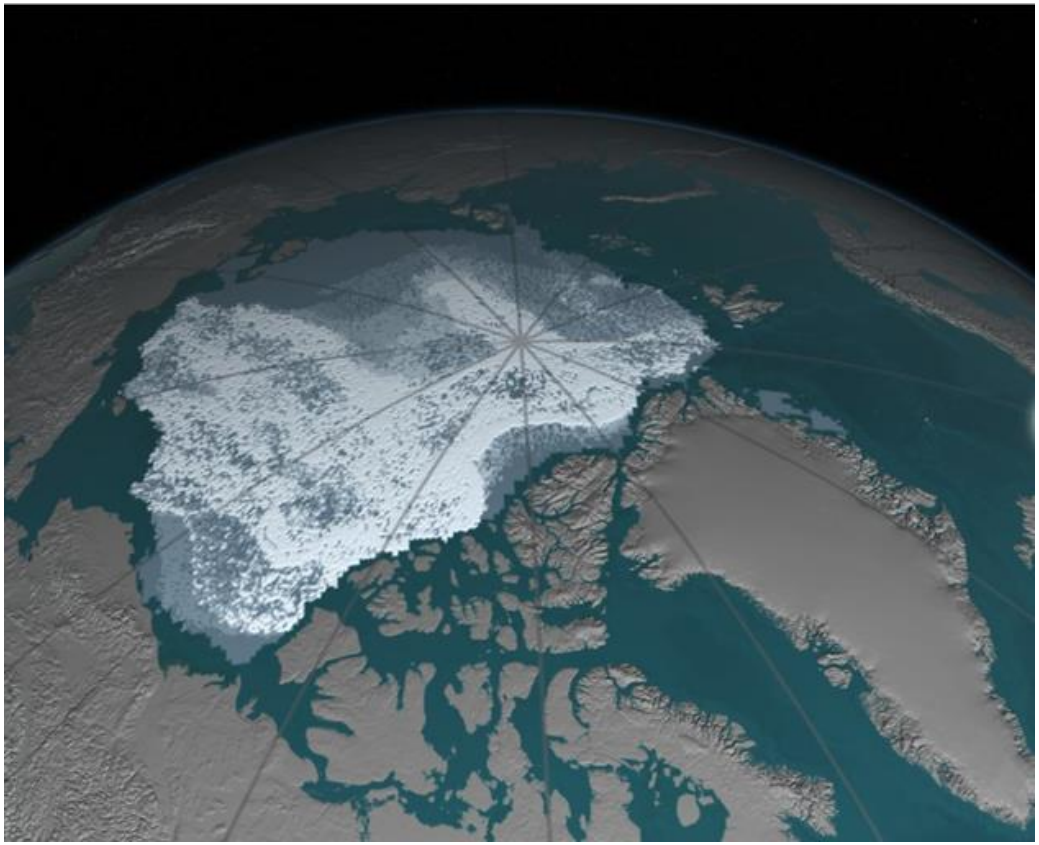
- Driven by the initiative of EiiF the following subsidy programmes have been established:

In Germany

In France

Marine Ice is Shrinking Dramatically in the Arctic…

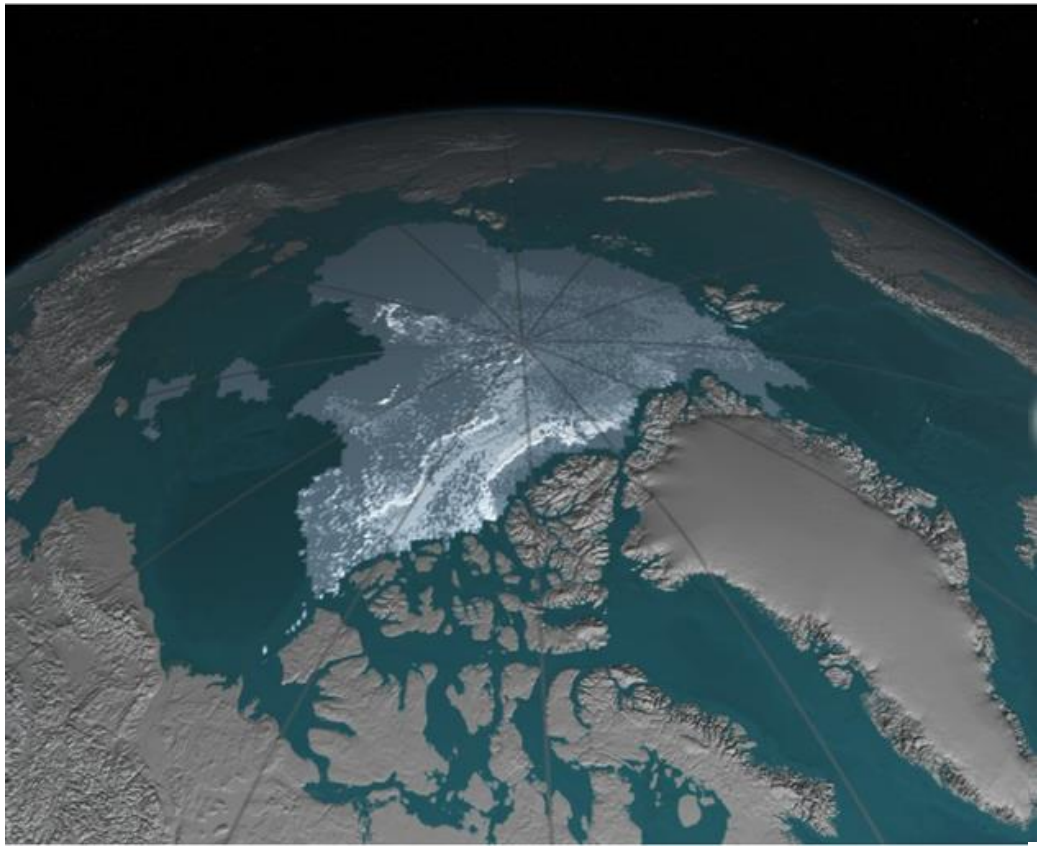
1984



Source:
http://www.spiegel.de/wissenschaft/natur/klima-globales-meereis-schrumpft-dramatisch-a-1122089.html

Marine Ice is Shrinking Dramatically in the Arctic…

2016



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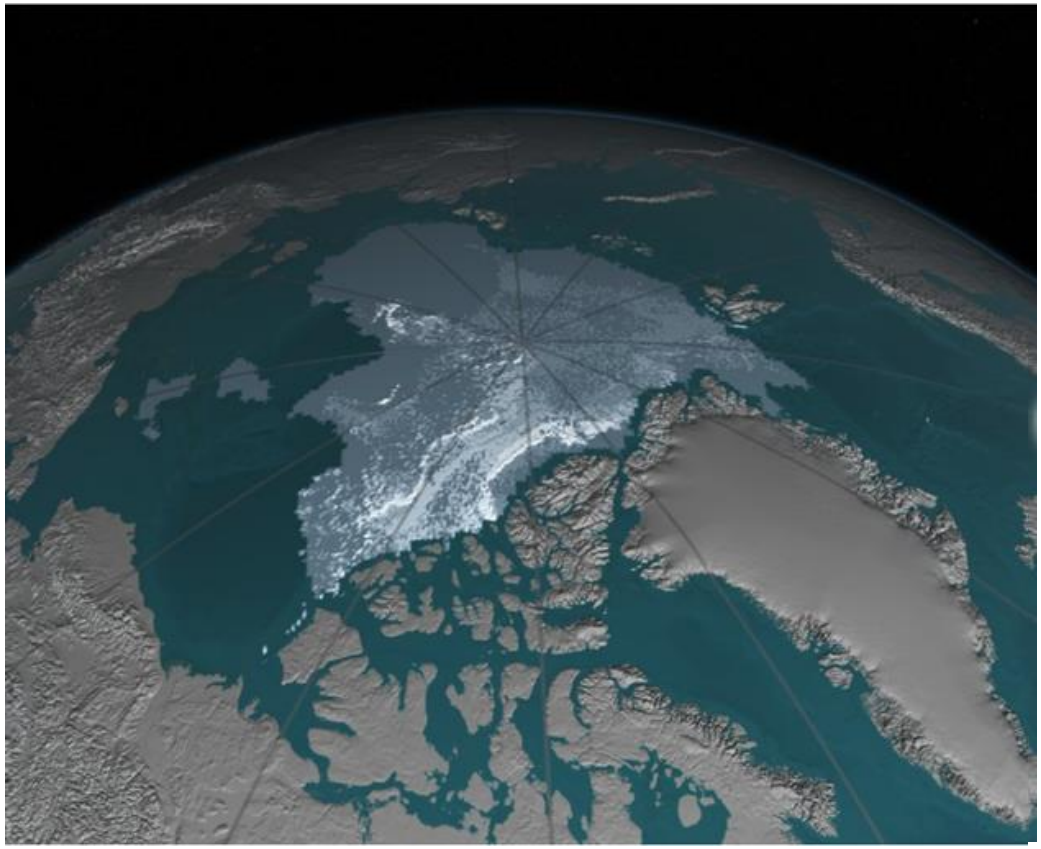
Marine Ice is Shrinking Dramatically in the Arctic…

2016

- ✓ **We need to take action now.**
- ✓ **No time to lose…**



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Ice Shrinking in the Arctic…

- The Guardian, 24 August:

theguardian

Russian tanker sails through Arctic without icebreaker for first time

Climate change has thawed Arctic enough for $300m gas tanker to travel at record speed through northern sea route

The Christophe de Margerie carried a cargo of liquefied natural gas from Hammerfest in Norway to Boryeong in South Korea in 22 days.

Thank You For Your Attention

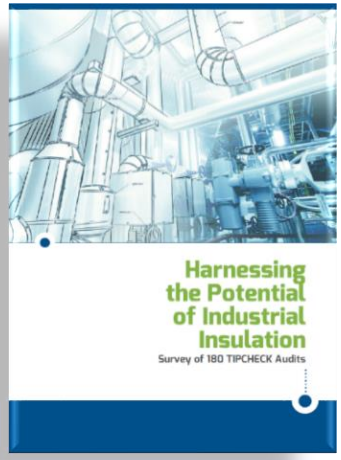
European Industrial Insulation Foundation

Avenue du Mont-Blanc 33
1196 Gland (Geneva)
Switzerland

Andreas Gürtler
Foundation Director

T: +41 22 995 00 - 70
F: +41 22 995 00 - 71
E: andreas.guertler@eiif.org

www.eiif.org



Survey of 180 thermal energy audits in EU industry

Download on www.eiif.org