Workshop

Industrie 5.0 - KMU spezifische Barrieren

Technische Universität Graz
Montanuniversität Leoben
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Herzlich Willkommen !

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The overall Goal of the SME 5.0 - Project

The "SME 5.0 - Project" focuses on providing a **Strategic Roadmap** towards the next Level of **Intelligent**, **Resilient**, **Sustainable** and **Human-Centred** SMEs.
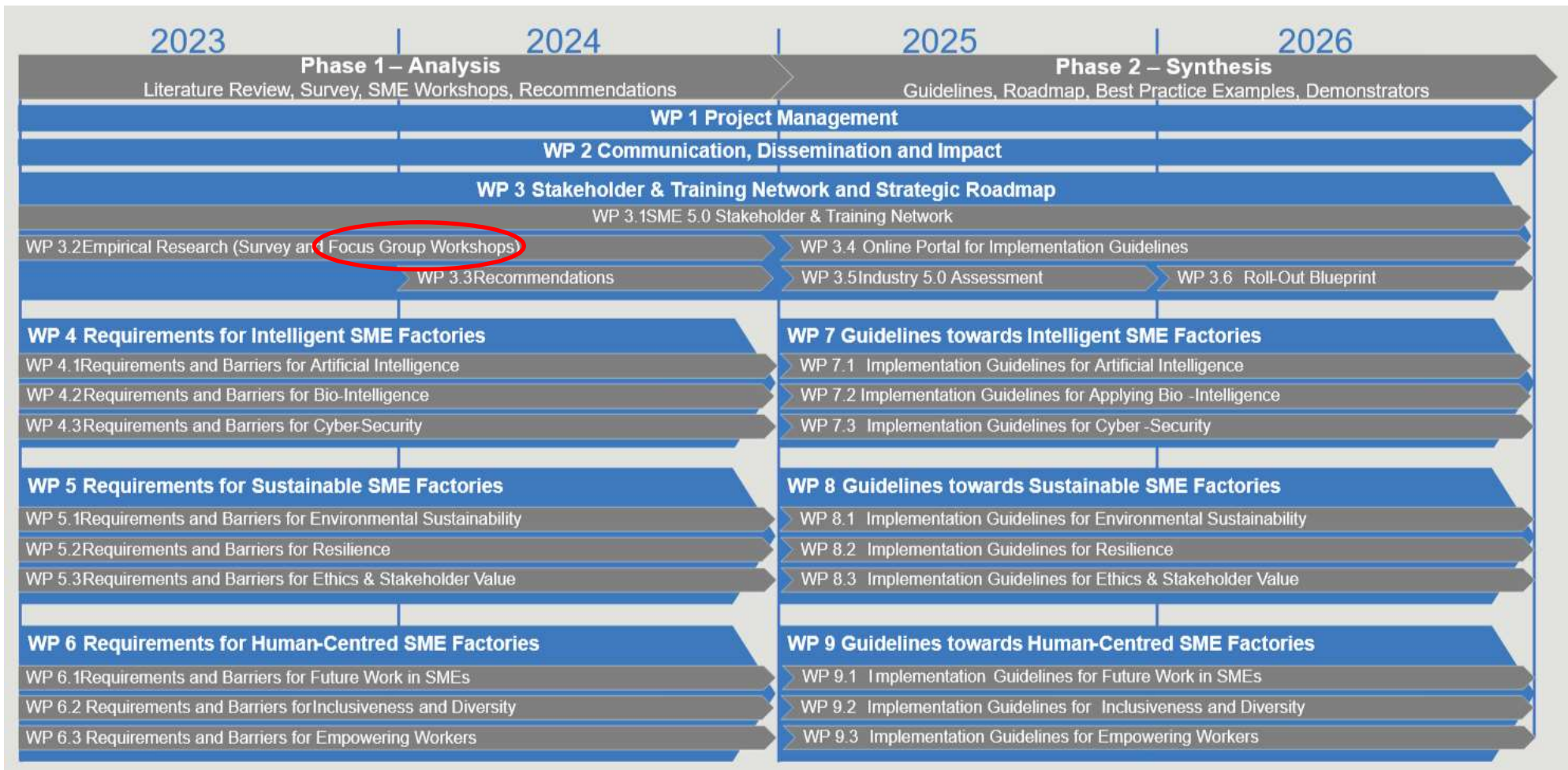
6 steps = 6 General Research Objectives:
Training Networks, Barriers-Identification, Status-Assessments,
Online Platform Development, Roll-out Planning, Recommendations to the EC.

Ziele des workshops

➔ Gleiches Verständnis zu den Inhalten
von Industrie 4.0 und Industrie 5.0 schaffen.

➔ Aktuellen Stand hinsichtlich Umsetzung von
Industrie 4.0 und Industrie 5.0 erarbeiten.

➔ KMU spezifische Barrieren zur Umsetzung
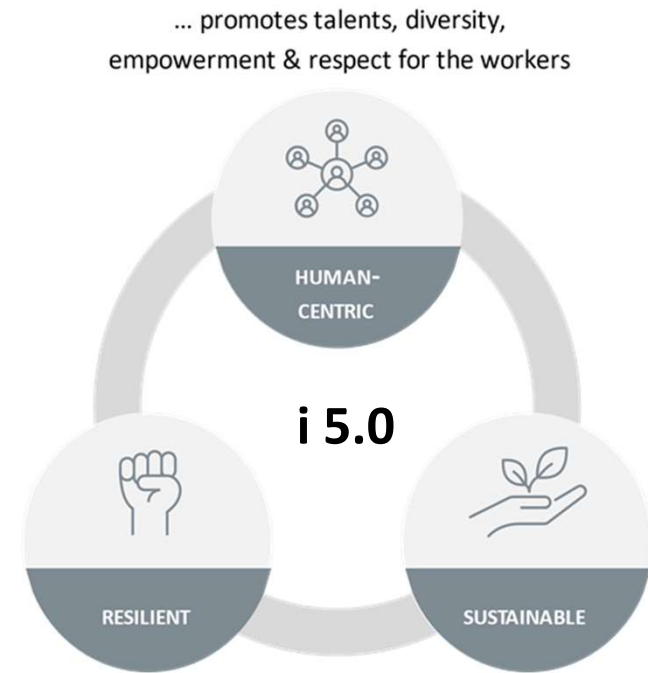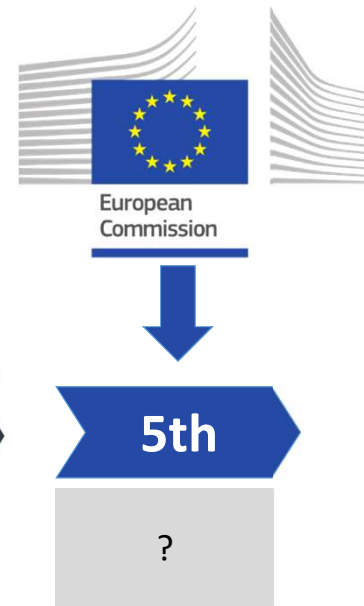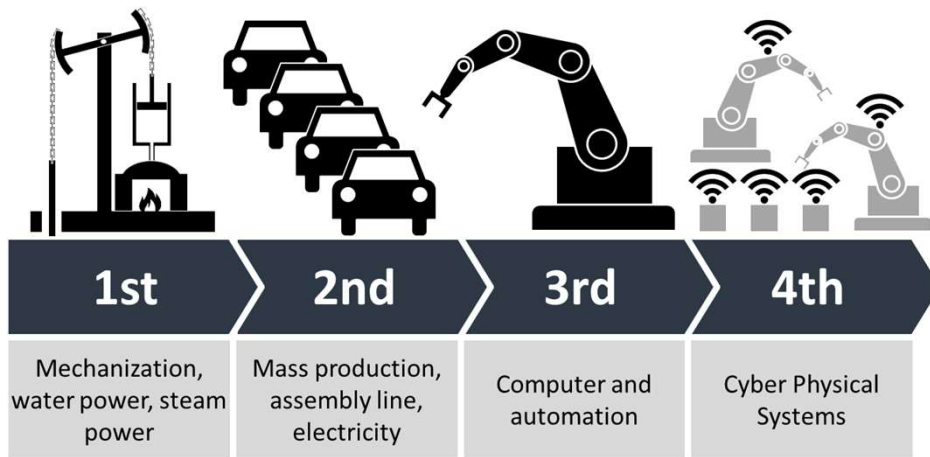von Industrie 5.0 sammeln und austauschen.

Agenda

		Duration in min	TOPIC
08:30	09:00	00:30	Tea and Coffee
09:00	09:30	00:30	Welcome, Introduction, Goals
09:30	10:15	00:45	Introduction of Industry 4.0 and Industry 5.0
10:15	10:30	00:15	Discussion about existing of planned use cases (i4.0/i5.0)
10:30	10:45	00:15	Break
10:45	11:15	00:30	Collection of company-specific needs and barriers
11:15	12:00	00:45	Finding the root cause of barriers, fish bone sticking
12:00	12:45	00:45	Lunch
12:45	13:15	00:30	Finding the root cause of barriers, fish bone sticking
13:15	13:45	00:30	Introduction of Austrian i5.0 hypothesis
13:45	14:15	00:30	Discussion on the Austrian i5.0 hypothesis
14:15	14:45	00:30	Proposals for first steps in industry 5.0
14:45	15:00	00:15	Closing the workshop

Kurz-Vorstellung der Workshop-Teilnehmer

- **Name**

- **Unternehmen**

- **Unternehmensinhalt**

- **Funktion im Unternehmen**

- **Standortbestimmung**

  Human Centred Work
  Sustainability
  Resilience
  Intelligence (AI, ML, Data Science, ..)

- **Wie wichtig?**
- **Wo stehen wir?**

Was ist industrie 4.0 ?
Was ist industrie 5.0 ?

... promotes talents, diversity, empowerment & respect for the workers

HUMAN-CENTRIC

i 5.0

RESILIENT

SUSTAINABLE

... is agile and resilient with flexible and adaptable technologies

... leads actions on sustainability and respects planetary boundaries

Dimension 1: **Resilience**

The ability of a system or an organisation exposed to hazards to resist, accommodate and recover in a timely and efficient manner. This includes the restoration of basic structures and functions as well as the precautions on basis of recognized potential threats.

Visually spoken:

SYMBOLS OF DANGER

Get back on the horse !

Think about potential threats !

Do prevention work !

in company language

- Accept and react asap
- Take it as a chance
- Analyse the root cause

- List potential threats
- Make an assessment
- Ranking the items

- Think about mitigation (T/O/P)
- Picture the measures in the budget.

Dimension 1: **Resilience**

**Typical Use Cases
for Resilience:**

**Typical Actions
for Resilience:**

- Sales Market
  drops dramatically

  - Check your client-structure
  - Innovate the Product Portfolio
  - Steadily control your fixed cost

- Supply Chain
  has been cut/destroyed

  - Go into double sourcing
  - Build up local networks

- Our company has been
  hacked/was intruded

  - Create a company wide awareness
  - Do precautions (T/O/P)

Dimension 2: **Human Centred Work**

Setting a high priority to the well-being, the health and the needs of workers. It pays attention to inclusion and diversity, employee empowerment, continuous learning and development, effective communication and feedback.

Visually spoken:

Create safe & healthy working environments

Develop workers, use their skills

Respect and listen to the workers

in company language ▶

- Build ergonomic work places
- Redesign highly stressful work
- Provide assisting tools

- Provide education
- Stimulate the workers
- Challenge the people

- Walk the Talk
- Appreciate new ideas
- Participation, Feedback

Dimension 3: **Human Centred Work**

**Typical Use Cases
for Human Centred Work:**

**Typical Actions
for Human Centred Work:**

- High rate of accidents at work
- High rate of sick leaves

- Go into higher safety precautions
- Provide assisting tools
- Integrate the related workers
- Find the true reasons for sick leaves

- Resistance against new technologies or processes

- Understand fears and exessive demand
- Let the people grow

- Important workers leave the company

- Understand the reasons immediately
- At least learn for the next generation

Dimension 3: **Sustainability**

Meeting the needs of the present without compromising the ability of future generations to meet their own needs. In business, sustainability refers to doing business without negatively impacting the environment, the community or the society as a whole.

Visually spoken:

Rethink the energy supply and consumption

Become part of a more circular economy

Enhance your profitability via going sustainable

in company language ▶

- Analyse all your energy consumptions.
- Build energy producing partnerships and become more independent.

- Select materials for reuse or recycling.
- Keep product carriers in the loop.
- Create according partnerships

- Exploit your material and reduce material consumption at most.
- Implement alternative energy supplies.

Dimension 3: **Sustainability**

**Typical Use Cases
for Ecological Sustainability:**

**Typical Actions
for Ecological Sustainability:**

- Upcoming Legal Directives

  →
  - Have an eye on it and prepare
  - Check the impact on your company
  - React early enough

- Exploitation of Resources

  →
  - Reduce process specific consumptions (electricity, materials, water)
  - Reuse, Refurbish, Recycle

- Green Technologies

  →
  - Watch the growing green initiatives
  - Think about alternative, renewable energies and other sustainable concepts

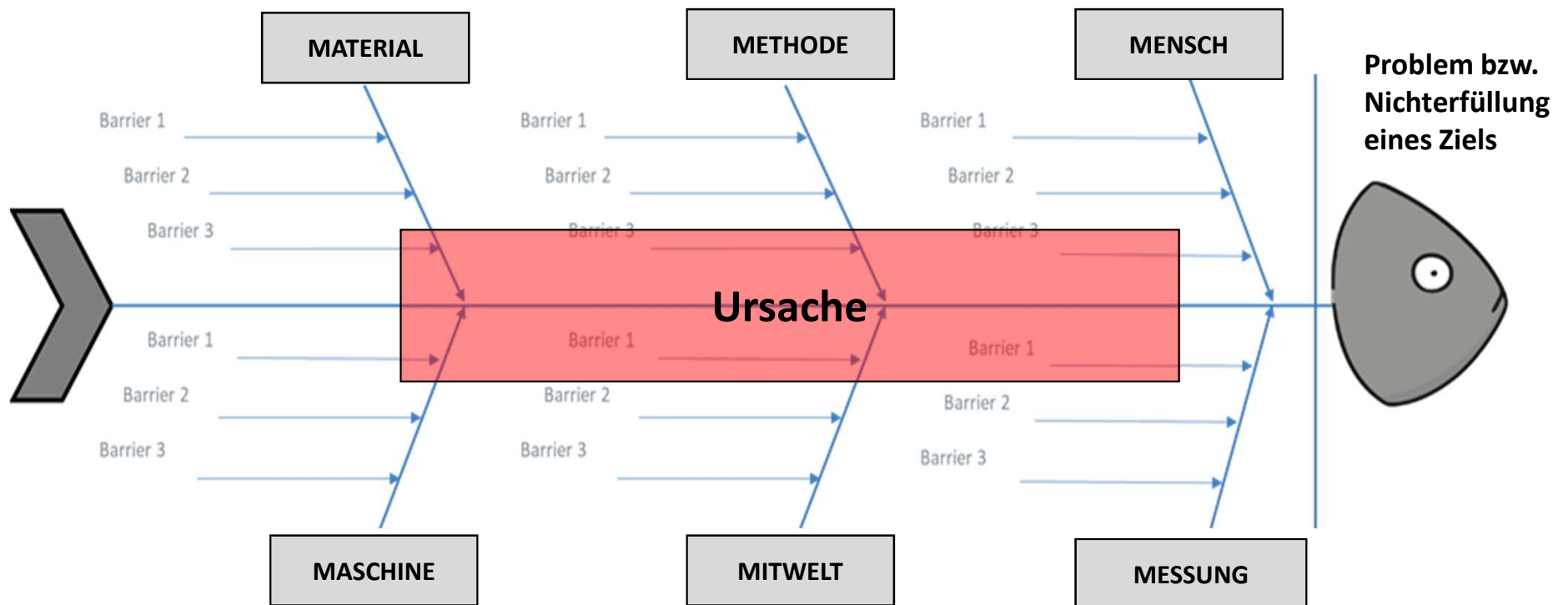# Diskussion zu bereits laufenden oder geplanten use cases i5.0

Welche Initiativen gibt es bereits im Unternehmen ?

Welche Initiativen planen Sie?

15 min

Collection of company specific barriers on industry 5.0 dimensions
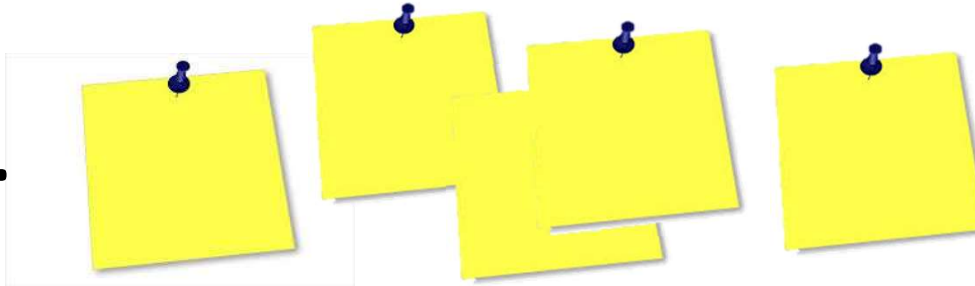
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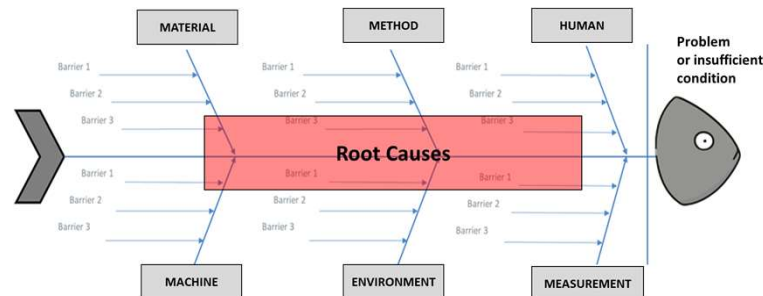| Resilience | Human Centred Work | Sustainability |

Auswahl des i 5.0 Themas

2.

Sammlung der Barrieren

3.

Klassifizierung der Barrieren

Mittagspause

45 min

Vorstellung der für Österreich gültigen i5.0 Hypothesen

Verdichtetes Ergebnis einer KMU Umfrage

Diskussion zu den österreichischen i5.0 Hypothesen:
Was sind typische Barrieren hinsichtlich …

- **Resilience**
  - R1: Unvermögen, Unterbrechungen in der Produktion nachhaltig zu lösen.
  - R2: Unvermögen, Unterbrechungen intern und extern zu kommunizieren.
  - R3: Unvermögen, Risiko-Analysen durchzuführen.

- **Human-centred work**
  - H1: Unvermögen, menschliche Fehler vorzubeugen.
  - H2: Mangel an wissensbasierter Unterstützung der Mitarbeiter/innen.
  - H3: Mangel an physikalischer/technischer Unterstützung der Mitarbeiter/innen.

- **Sustainability**
  - S1: Lange Transportstrecken zu den Kunden.
  - S2: Keine Kreislaufprodukte (Produkte ohne Wiederverwendung oder Verwertung).
  - S3: Produktionssysteme, welche nicht auf Kreislaufwirtschaft ausgerichtet sind.

Resilience

Human Centered Work

Some basic ideas for getting started in Industry 4.0

Disruptive Technologies:

(Robotics, AGVs, 3D printing, Wireless Networks, RFID, 5G, IoT, Horizontal/Vertical Integration, Edge Computing, Cloud Computing, Augmented Reality, Metaverse, Data Analytics, Artificial Intelligence, ………..

Major Barriers:

High investments with an ROI hard to calculate, Lack of educated people, Highly sensitive – not always robust – systems, overforcement, ……

Some basic ideas for getting started in Industry 4.0

Create Playgrounds!

Low Cost Cobot
e.g. UR3 or UR5

Low Cost
3D Printer

Microcontroller
Starter Kit

RFID
Starter Kit

Some basic ideas for getting started in Industry 4.0

Work with your Data!

Start with small projects and grow later !

Collect your data

especially in the environment
of your core interest

Analyse your data

Understand your processes
better, learn,
find unknown correlations

Use your data

Create hypothesis,
deductions, proofs.
Test it, fix it.

Some basic ideas for getting started in Industry 4.0

Cooperate with Universities and Startups!

Use the power of young and highly interested people.
The students are still uncomplicated, flexible and low cost.
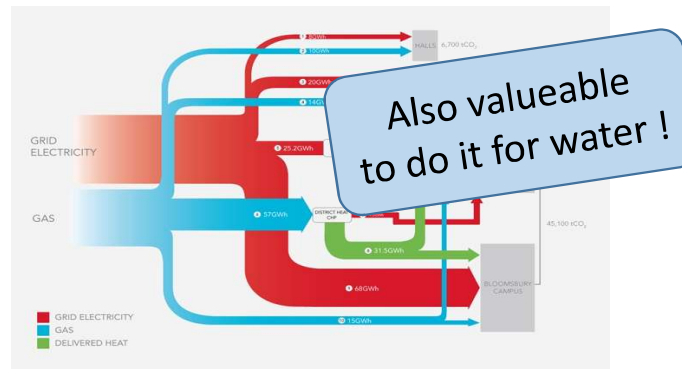Maybe they become your employees. Recruiting at its best!

Some basic ideas for getting started in Industry 5.0

Get your energy flows improved!

Find your power guzzlers

Get to know:
Which, When, Why

Also valueable to do it for water !

Create an energy flow chart for the whole company

Know where to tackle first

Change over to more renewable energy
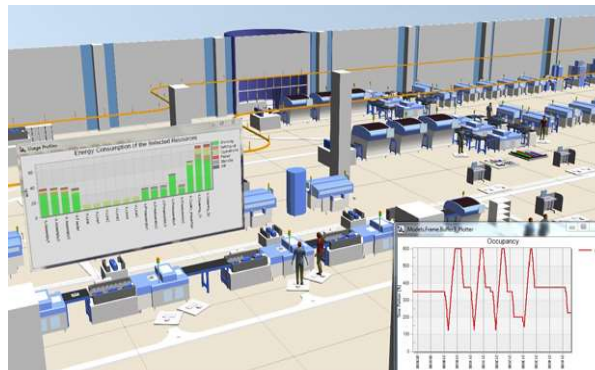
Do first small projects for quick wins and learnings

Some basic ideas for getting started in Industry 5.0

Use both the machines and humans skills!

Create a reasonable mix

Automation is not a self-purpose, it must pay off

Simulation

Get insights even in complex networks and their influences

Work with cobots

No replacement but an upgrade of workers

If money would be no problem
Which projects would you like to do?

Was sind Ihre heutigen **KEY TAKEAWAYS** ?

- **Danke für Ihr Interesse und Ihre Mitwirkung !**

- **Wir werden die weiteren Ergebnisse mit Ihnen teilen.**

- **Alles Gute für Ihre weiteren Aktivitäten in Sachen Industrie 5.0!**