«Automasjonsprosjekter – spørre – evaluere – velge»

Frode Grimsbø

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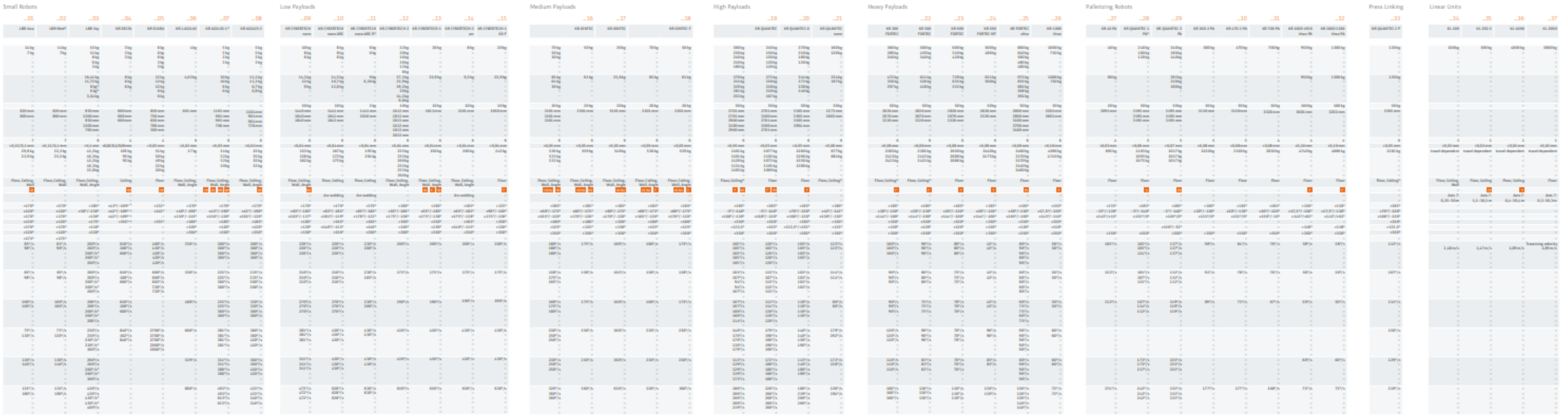
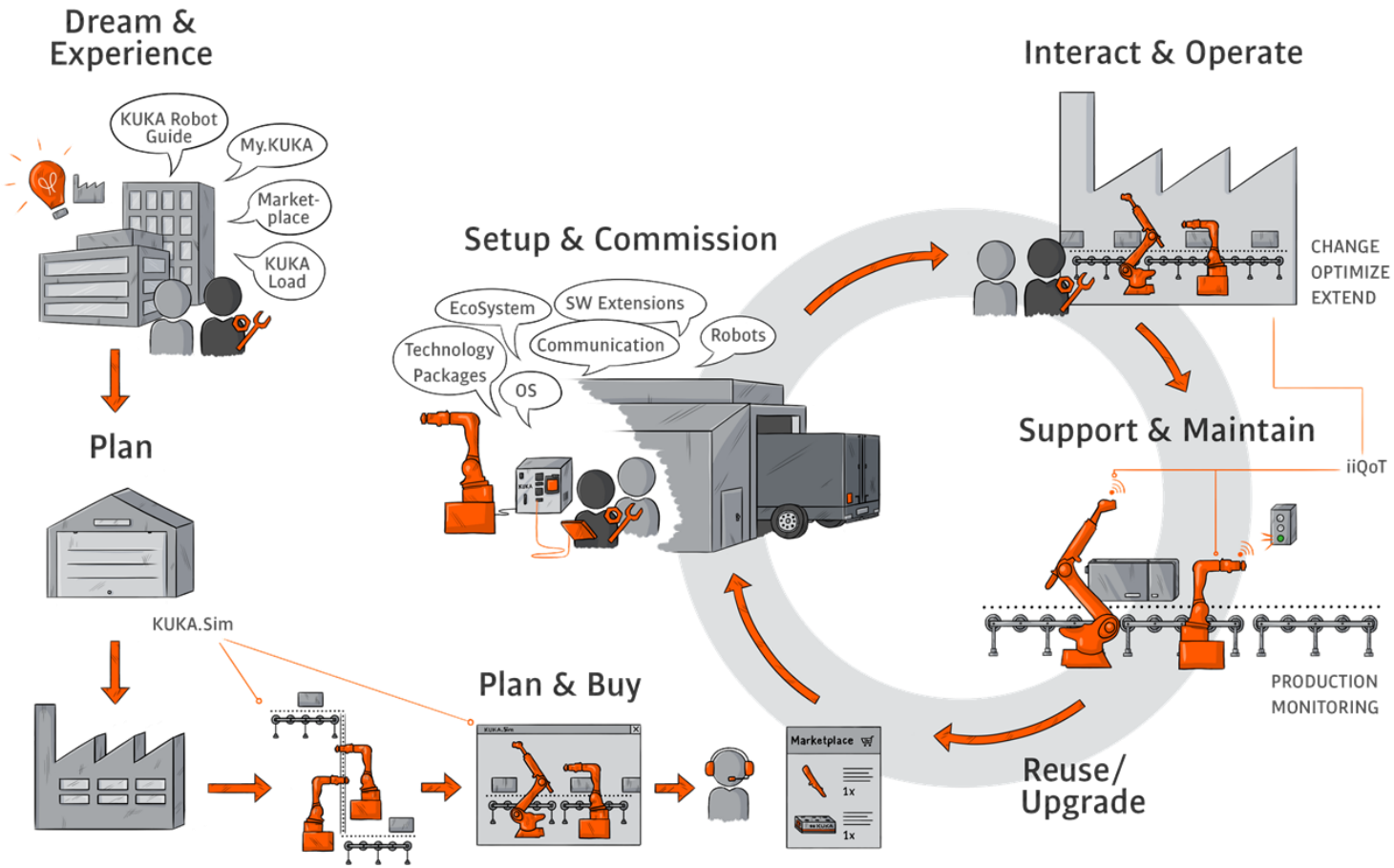



>100
Locations
> 60 countries


15.000
EMPLOYEES

Digitalization - Industrial Intelligence



Hva er hensikten med en forespørsel?

Skape en felles forståelse av behovet, internt og eksternt.

Beskrive egne produkter med kvalitet, toleranser og andre krav.

Sørge for at alle tilbydere får samme informasjon.

Legge grunnlaget for en god evaluering av innkommen tilbud.

Hva bør forespørselen inneholde?

Detaljer om inngående materialer.

Detaljer om produktet som skal produseres.

Krav til kapasitet, toleranser, kvalitet +++

Ønsker for brukergrensesnitt, operatørpaneler og lignende.

Dagens layout.

Husk at bilder forteller mer enn 1000 ord.

Evaluere tilbud?

Har tilbyderen akseptert dine behov og krav?

Skaper tilbudet en entydig og felles forståelse?

Benyttes det standardiserte produkter. Hardware og Software?

Finnes det et godt serviceapparat for komponenter i totalløsningen?

Garanti.

Opplæring

Husk at en simulering forteller mer enn 100 bilder.

Hva får du for pengene?

Collaborative eller Industri robot

Collaborative robot

Industrial robot

Noen påstander og fakta.!

Collaborative robot

Not true – always needed

Not true – always needed

Partly true

Low weight

Needs safety equipment

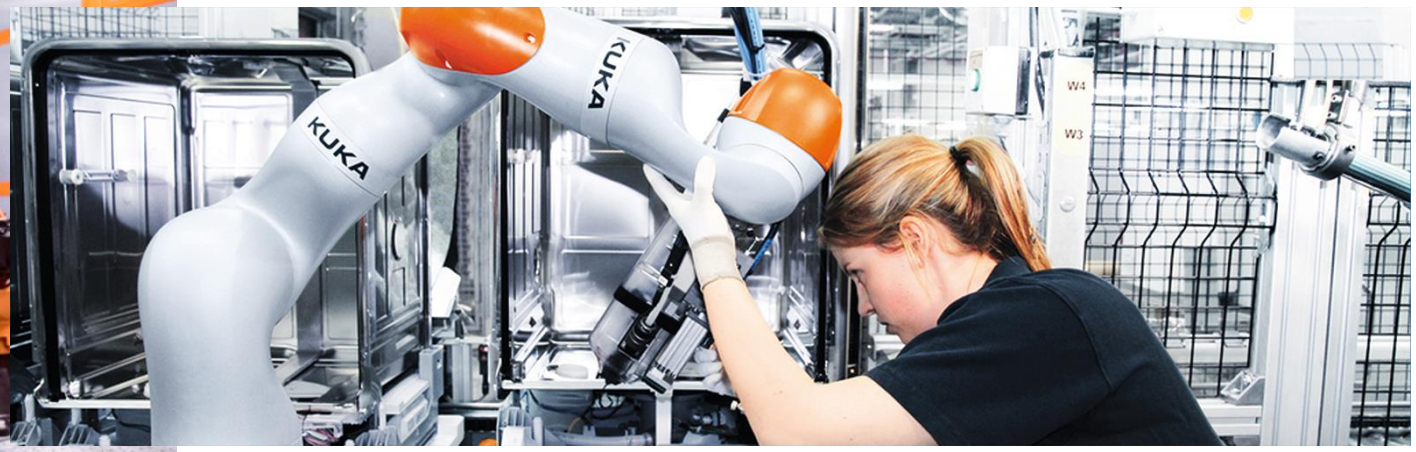
Needs CE marking

Partly true

Heavy

Industrial robot

Se alltid på applikasjonen
med andre ord ditt behov




Total Cost of Ownership
TCO
Ownership
Cost
Total
costs
service
concept
decisions
purchase
make
initial
used
insurance
repairs
fees
term
just
industry
financial
often
Technology
maintenance
Information
must
adds
price
similar
earlier
software
trying
included
Managers
Rather
calculate
Industries
discussed
management
began
elevator
analysis
analyst
calculating
Napoleon
prove
Many
like
railway
complete
shown
considered
interest
cited
Although
help
easily
pay
engineers
connection
calculator
system
taxes
evaluating
evaluation
funds
incurred
people
training
looks
complex
includes
effectiveness
map
car

What is the TCO of a robotic cell?

<u>The costs can be divided into:</u>

- Investment
- Service
- Operating costs
- Repairs

What is the cost of a robotic system?

Difficult to answer, but compare that with:
“what does it cost to own a car?”

This depends on a number of factors:

- What size of car do you need?

- How often or far do you drive?

- How do you drive?

- Load of the car

- TCO - Total Cost of Ownership of Robot Systems
  - Investment

The right robot for each task keeps the investment down

- Investment – be careful!

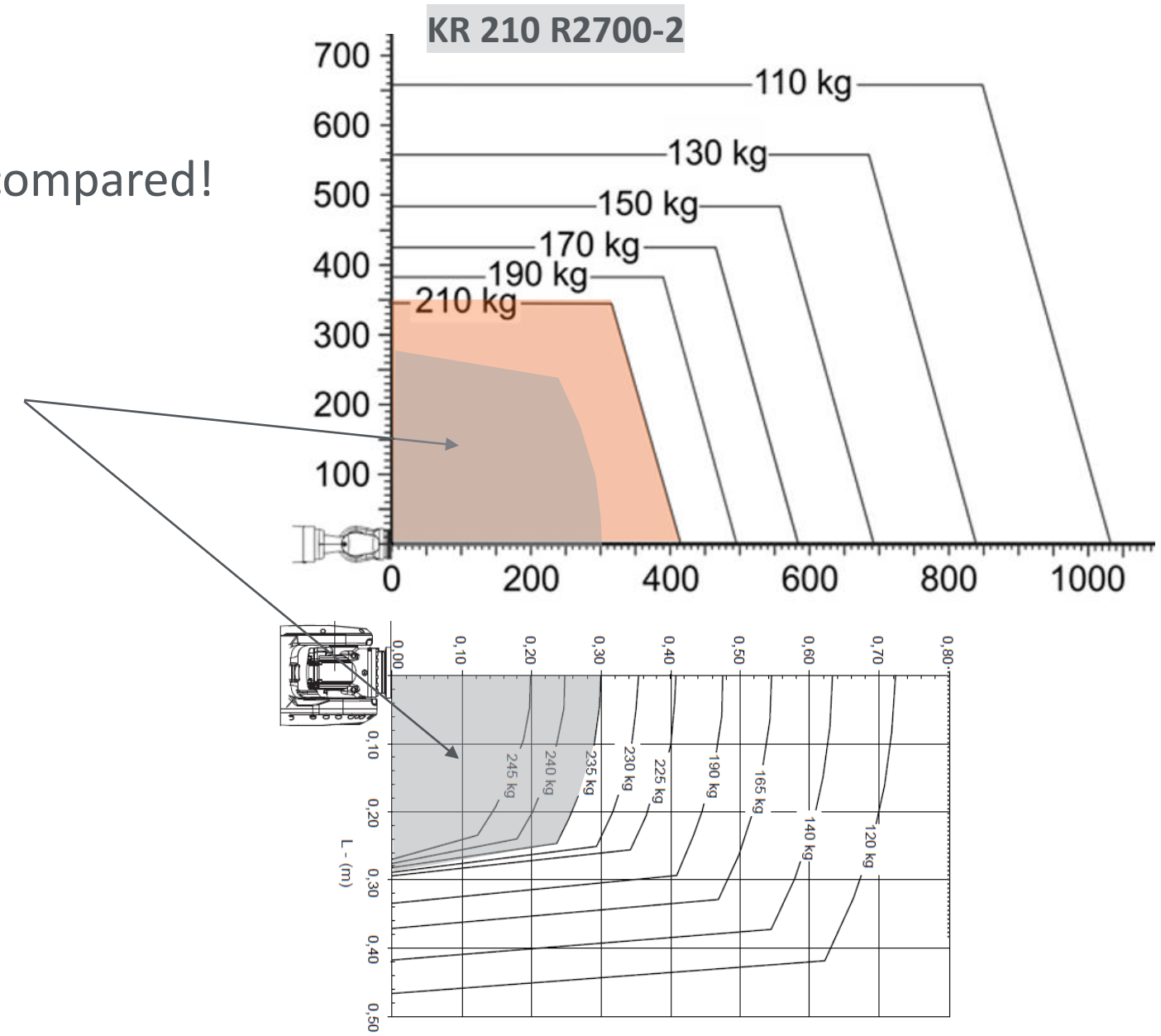
  - 100kg is not 100kg when compared!

The “comfort zone”

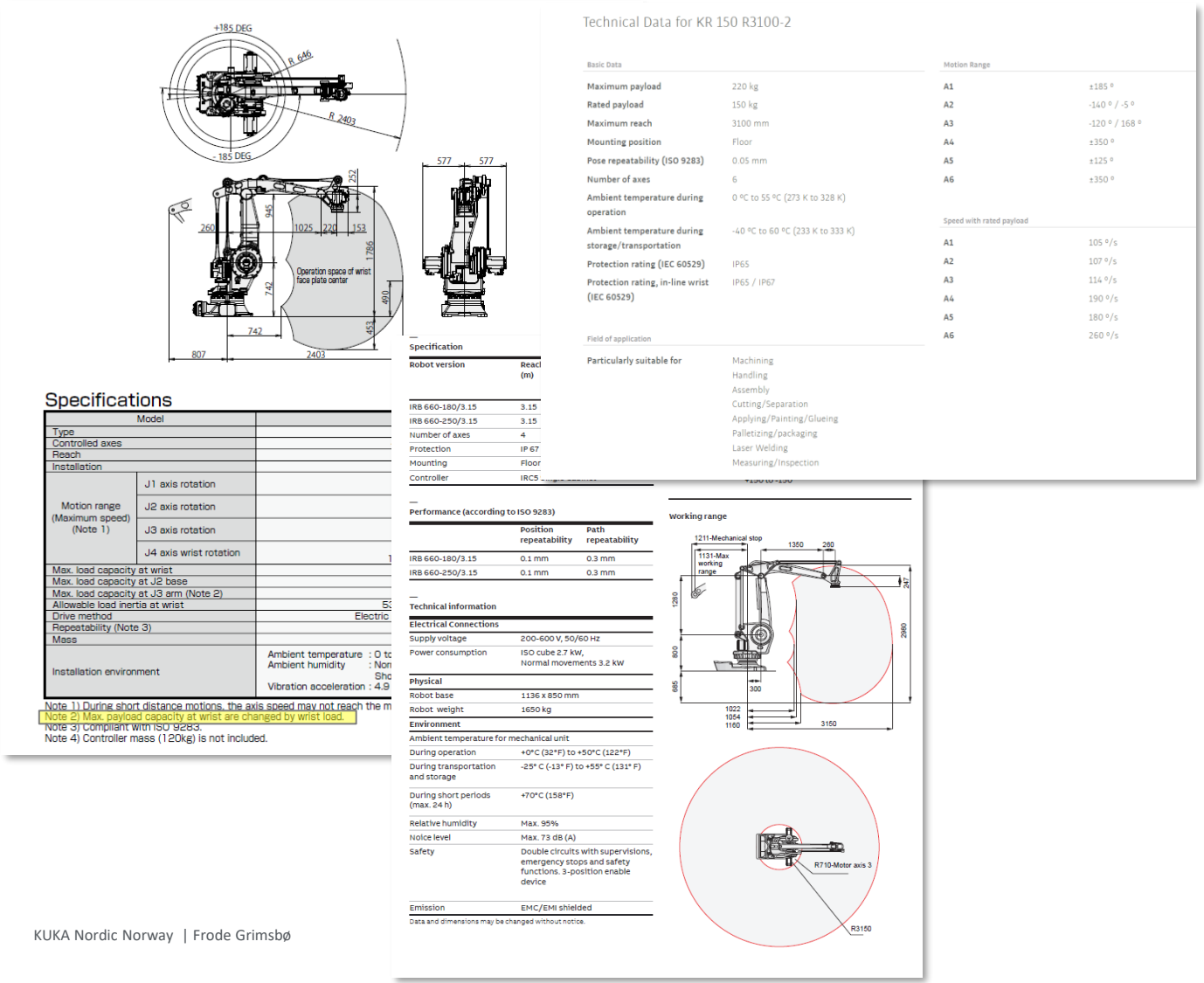
_is the zone in the payload diagram where a robot can at least still carry his nominal payload

Let’s compare the comfort zones

Please note: The type of robot is not important at this point as we want to make a general comparison.



The fact is that every robot supplier defines their payload differently!



Moving to a higher payload class will generete:

- A higher purchase price
- A more powerful robot probably requires a sturdier floor/foundation
- A larger robot has typically more expensive spare parts
- A more powerful robot will also consume more energy

TCO Structure Robot System 14 Years Operating Life

The cost distribution defines/prioritizes the development activities that will lead to a significant reduction of TCO

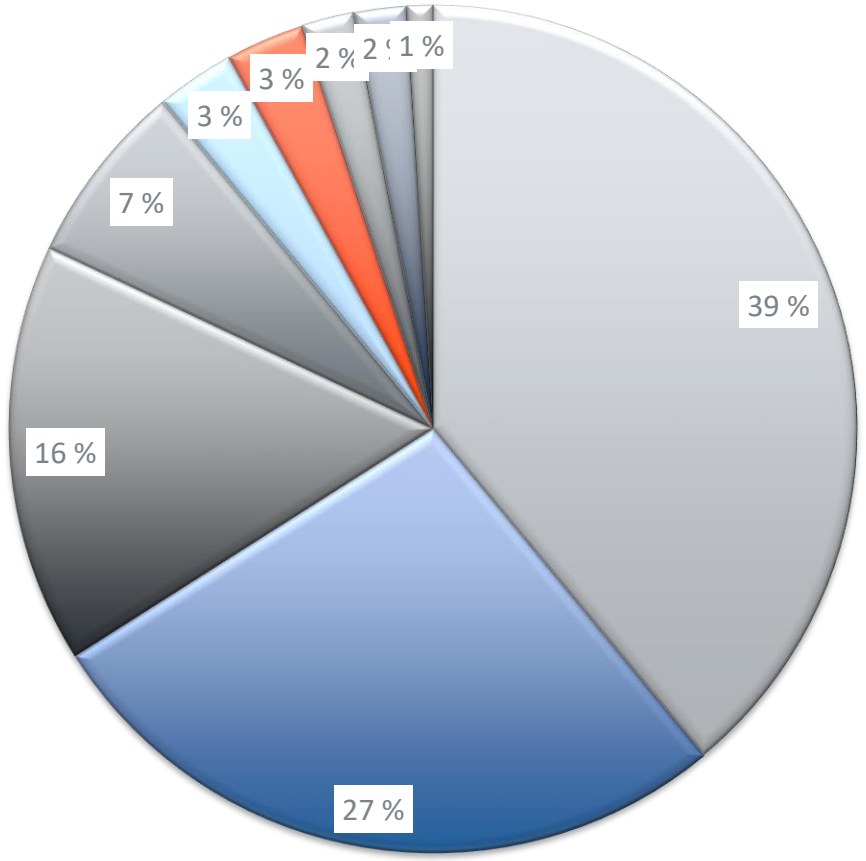
Example based on automotive installation measured 2019

- ***Evaluation*** of cost segments over 14 years “Operating Life”
  - Energy Costs based on a defined “Load Profile”
  - Integration Costs include “Second Life”

Main Cost Drivers

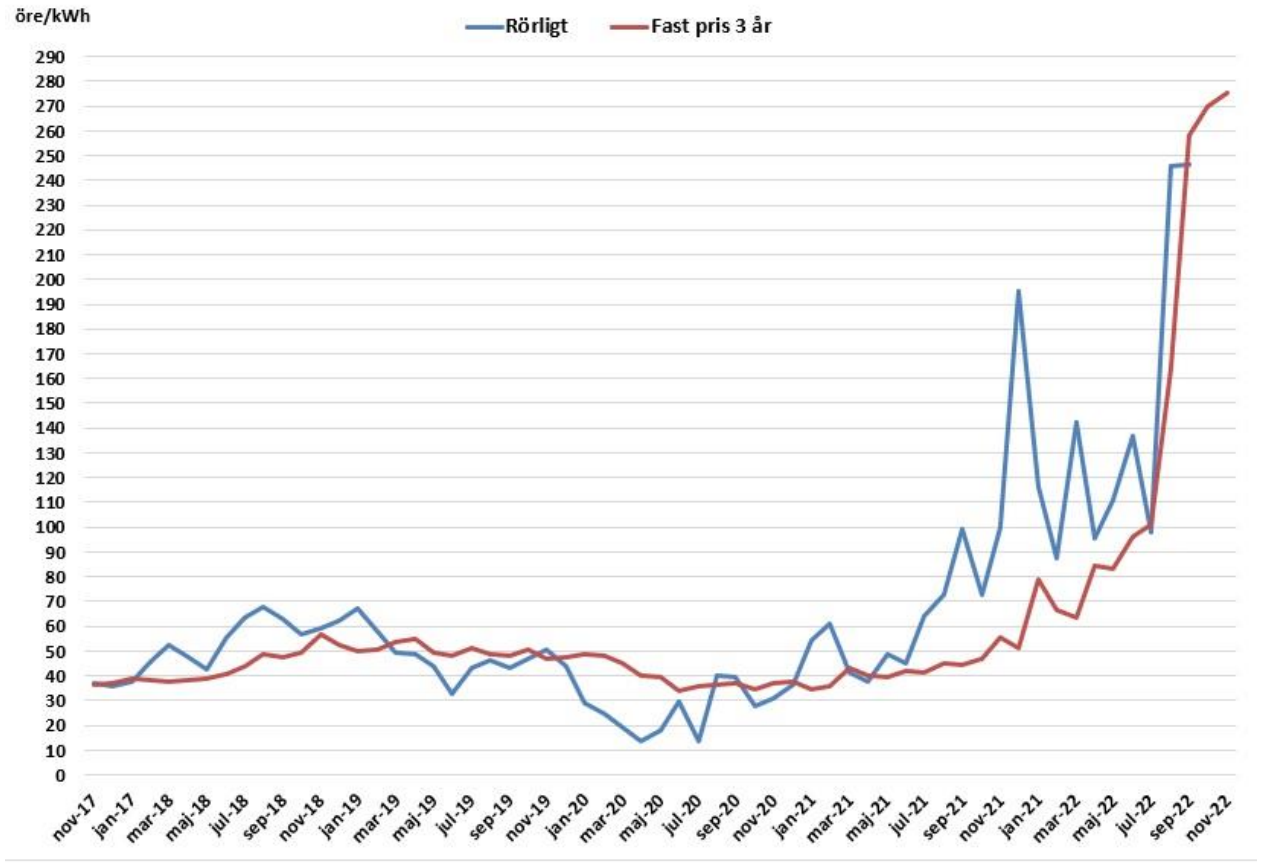
• Initial Invest	39%
• Energy	27%
• Integration	16%
• Spare Parts Controller*	7%
• SW-Licenses & SW-Upgrades	3%
• Spare Parts Robot Arm*	3%
• Maintenance Consumables	2%
• Refurbishment Analysis	2%
• Training	1%

*Cost calculated on MTBF figures



Cost of electricity over the last 5 years

- Sweden region 3 average monthly cost



<u>The price for electricity is driven by 2 major factors:</u>

- War Russia vs Ukraine – embargos versus Russia
- Electrification of society – energy production not increasing in line with consumption

It is not likely that price for electricity will return to 2019 levels even if the war ends

TCO doubled price for each kWh (compared with 2019)

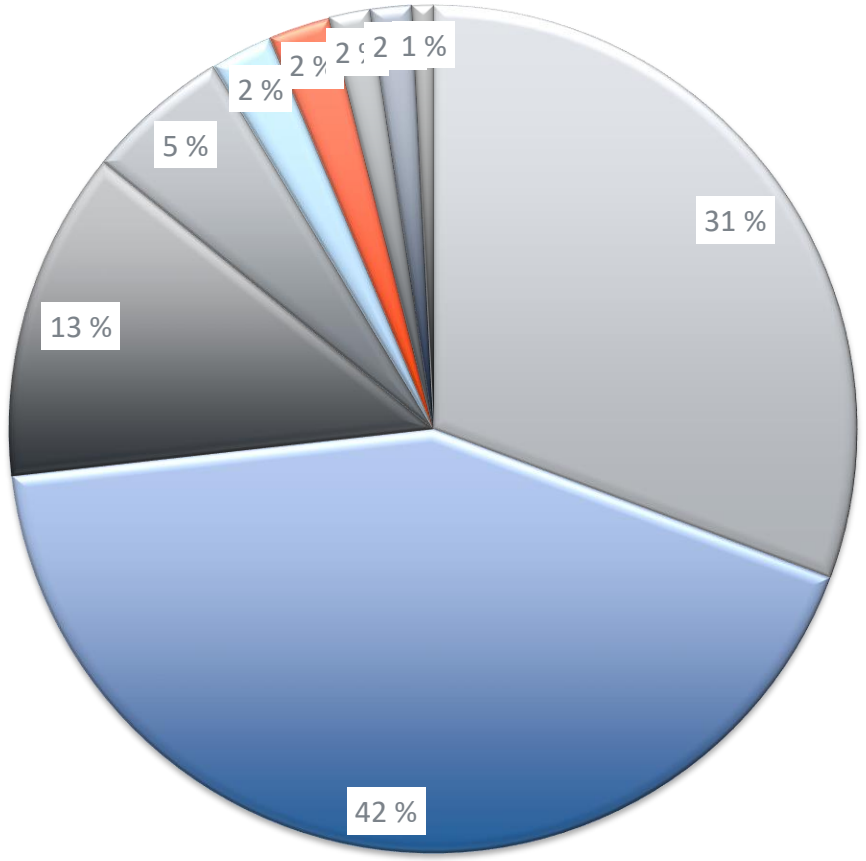
The cost distribution defines/prioritizes the development activities that will lead to a significant reduction of TCO

- ***Evaluation*** of cost segments over 14 years “Operating Life”
  - Energy Costs based on a defined “Load Profile”
  - Integration Costs include “Second Life”

Main Cost Drivers

• Initial Invest	31%
• Energy	42%
• Integration	13%
• Spare Parts Controller	5%
• SW-Licenses & SW-Upgrades	2%
• Spare Parts Robot Arm	2%
• Maintenance Consumables	2%
• Refurbishment Analysis	2%
• Training	1%

*Cost calculated on MTBF figures



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