



TVM

**A paradigm shift in mill
performance.**

SmartMill

powered by **Bühler** Insights

Innovations for a better world.

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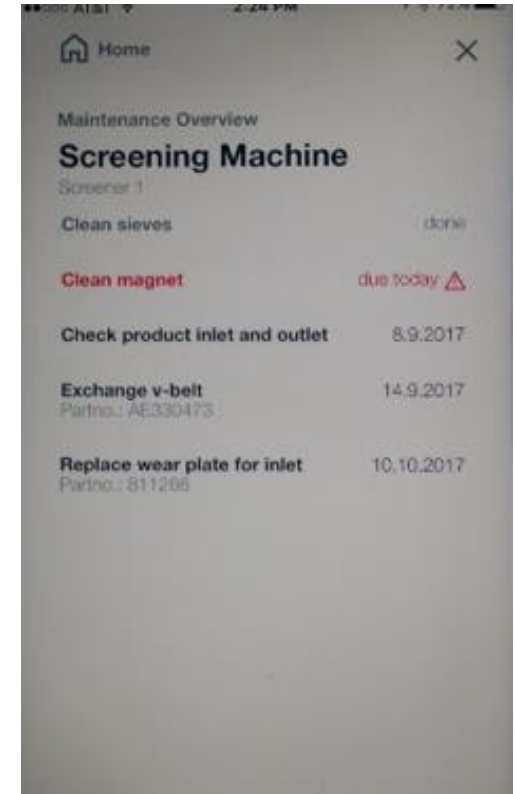
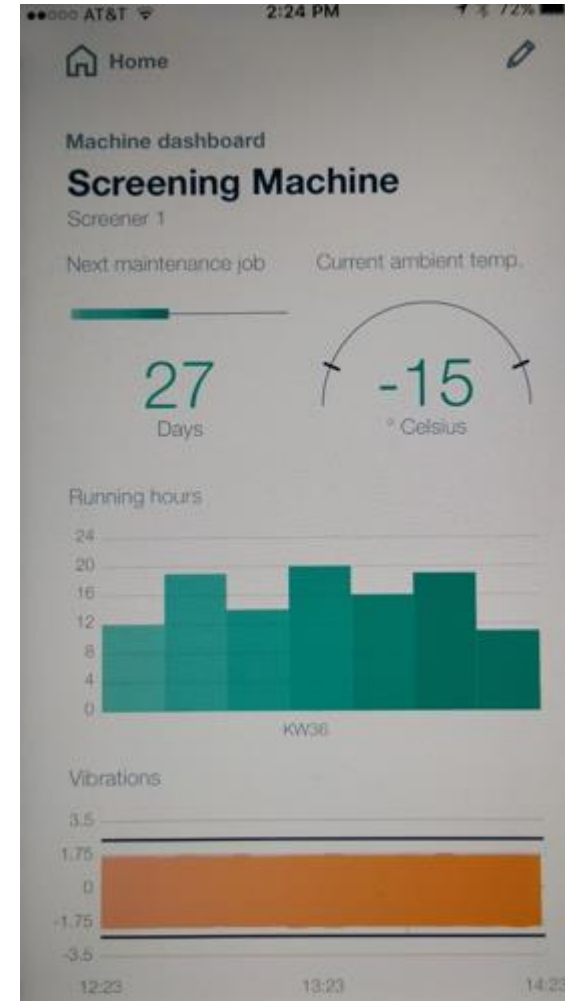
Transitioning technology
Making the shift...
In roll performance

It wasn't that long ago, since we starting working on new ways using IoT to engage with machines to allow millers to be productive.

Connecting machines - we can constantly monitor the machine to make sure it is running at its best possible parameters.

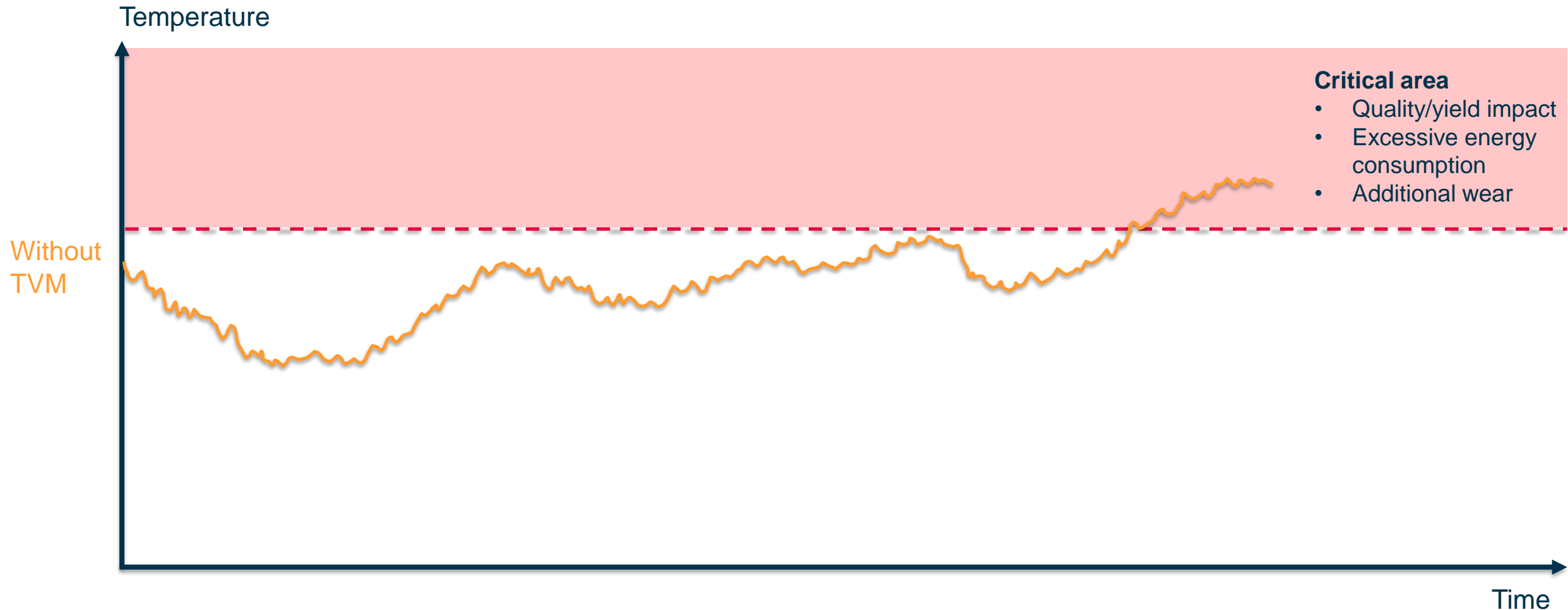
Just think if you can have your best operator running the mill every single second of the day – you would have better production wouldn't you?

What could be other ways we can improve?



We are doing new things with
rolls.

Grinding process stability



Graph for visualization purposes only

Some of the current pain points milling companies face ...

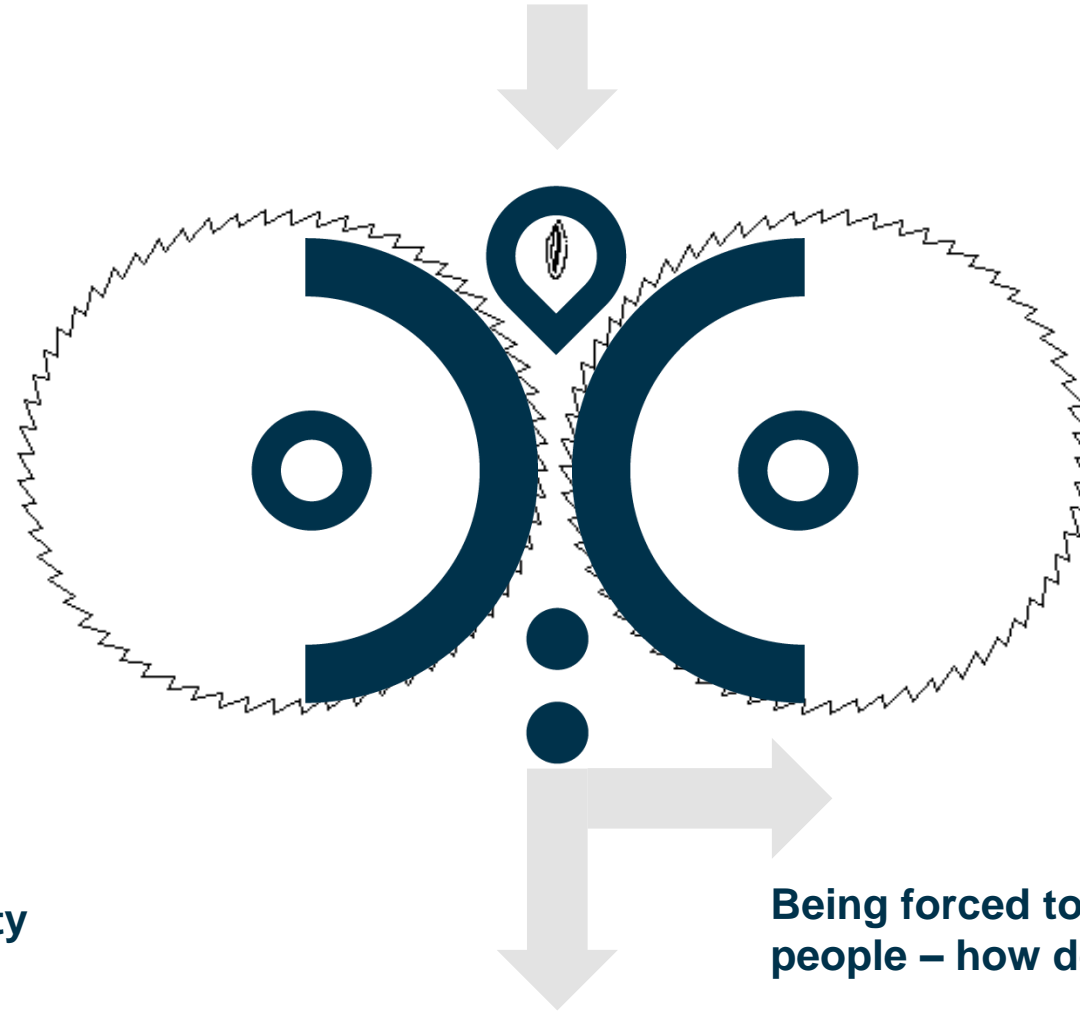
Finding qualified personnel

Time it takes to learn the process for employees.

Rising Commodity and energy costs

Maintaining high yield with fluctuations in wheat quality

Being forced to do more work with less people – how does the work get done



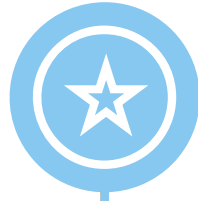
Temperature and Vibration Management in the rolls.

What are the benefits that this can bring.



Detecting critical conditions in the mill

By detecting critical operation condition early, like over-temperature or high imbalances, you can ensure a **safe**, reliable and predictable operation.



Constant product quality - low energy

With TVM, you can make sure that your product quality remains constant while minimizing energy consumption, even remotely.



Precise process know-how

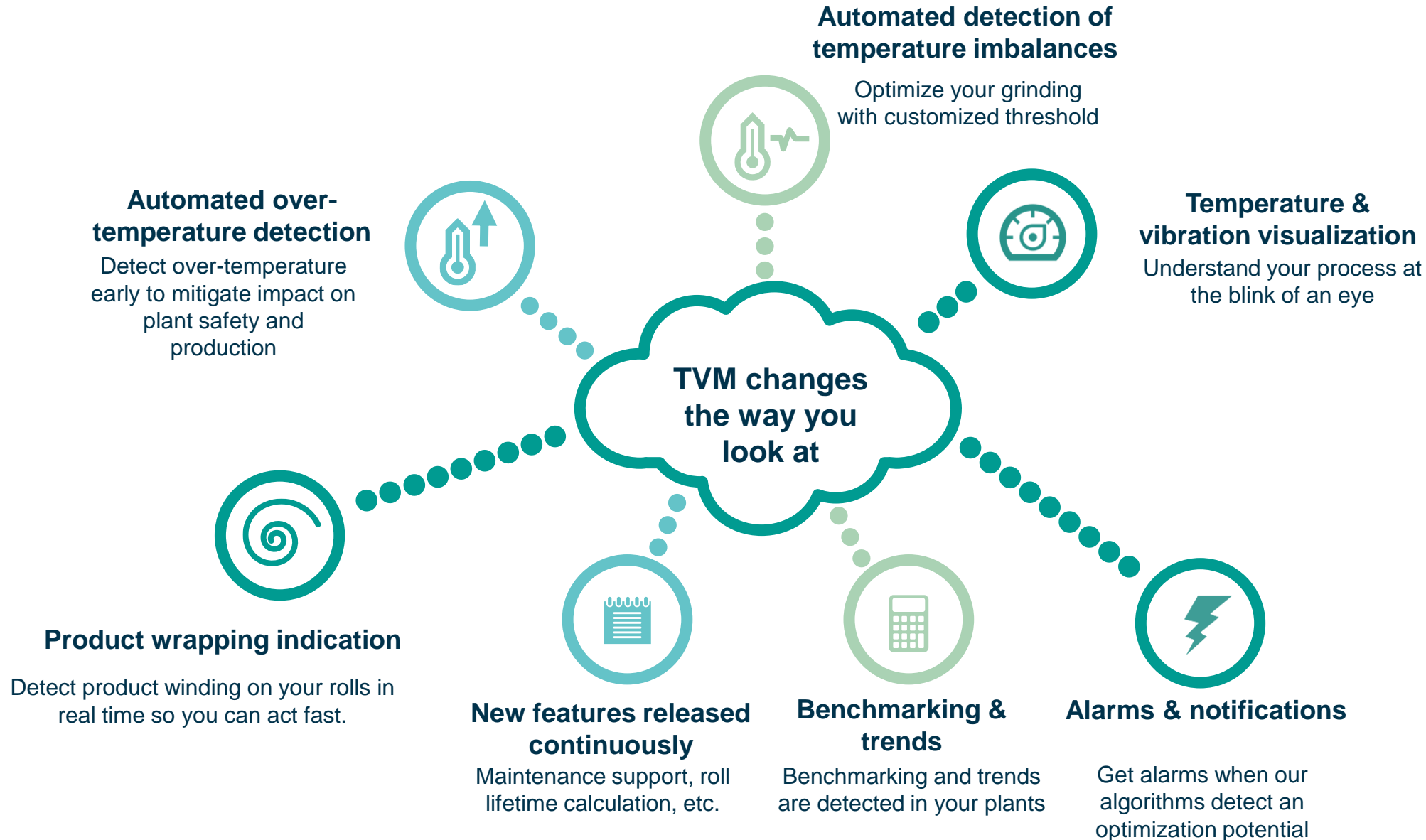
TVM offers the chance for the miller to understand the grinding process based on data.



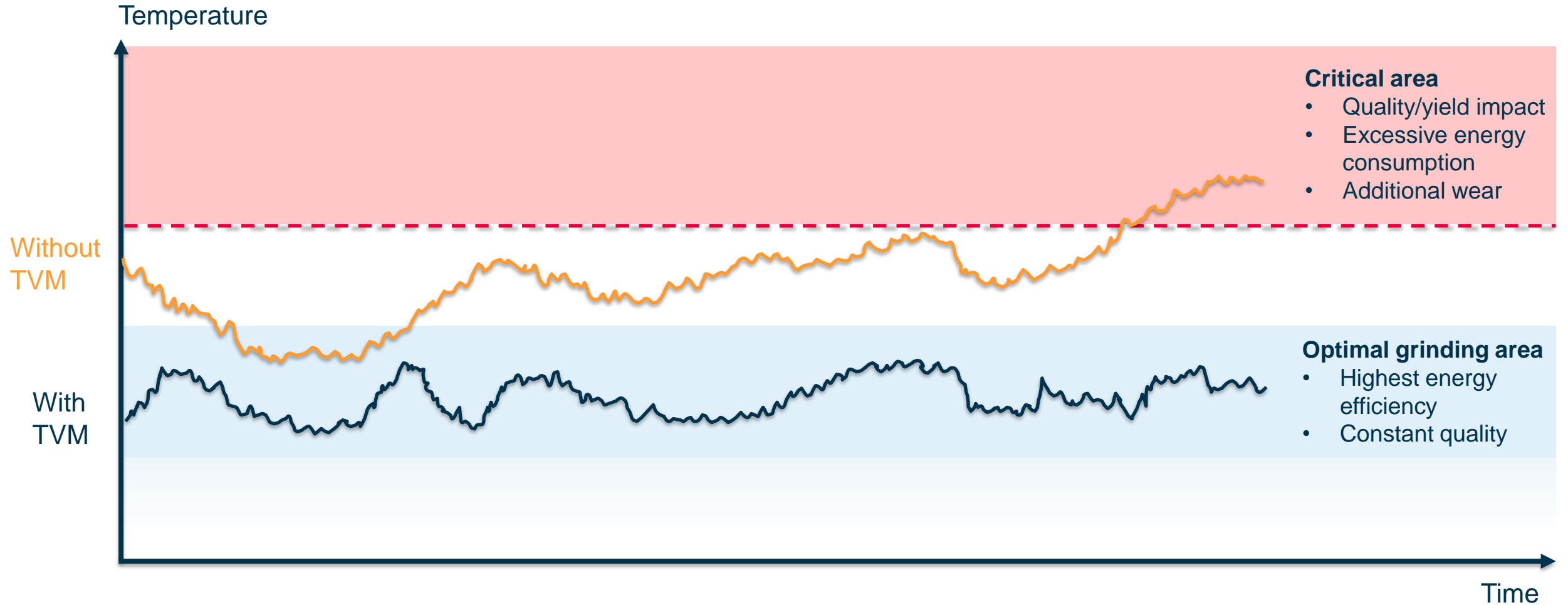
Data transparency

TVM provides detailed temperature & vibration information to compare your plants and production lines.

Taking a look at the benefits using this new roll technology.



Grinding process stability



Graph for visualization purposes only

What can be done to help?

The paradigm shift begins with...

Temperature and Vibration Management.



Temperature imbalance side-to-side.



High temperature imbalance over 30°C between left (blue) vs right (green) side of the roll.

→ Not recognized by the operator

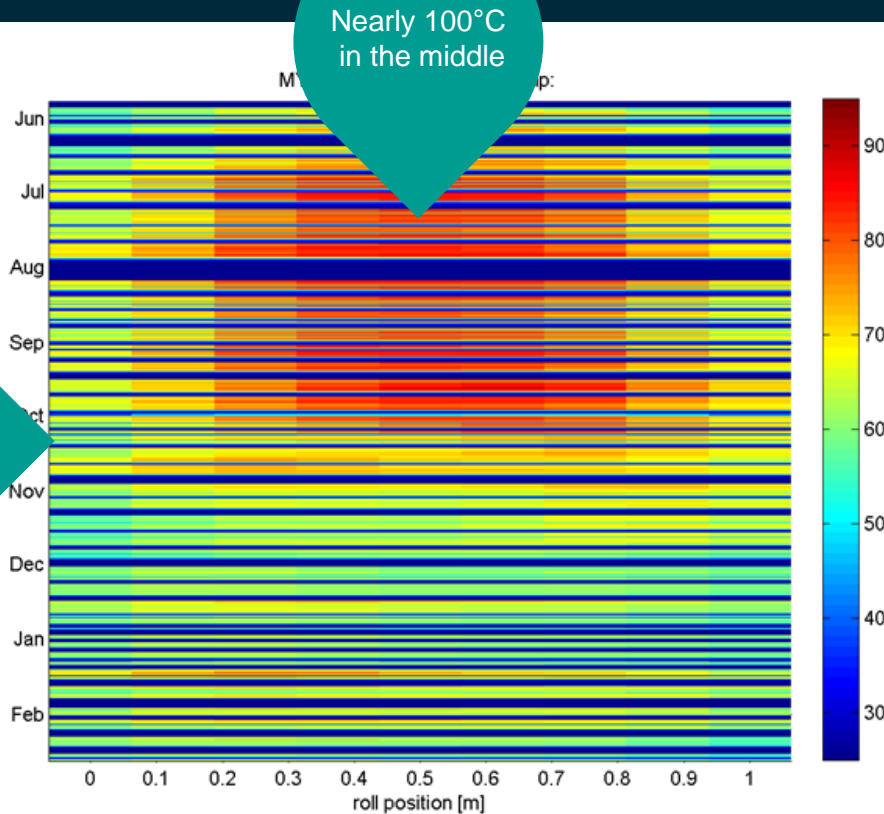
Impact

- Uneven granulation over roll length
- Uneven roll wear
- Additional energy consumption
- Throughput loss

Actions

- Adapt the rollers to an optimal temperature distribution over the whole length of the roller

Temperature imbalance middle-to-side.



Oct 9
changed
feeding gap

Nearly 100°C
in the middle

High temperature difference between left/right side of the roll compared to the middle of the roll.

→ Not recognized by the operator

Impact

- Uneven granulation over roll length
- Uneven roll wear
- Additional energy consumption
- Throughput loss

Actions

- Adapt the rollers to an optimal temperature distribution over the whole length of the roller
- In this case: feeding gap adjustment
- Alternatively: Roll cambering adjustment

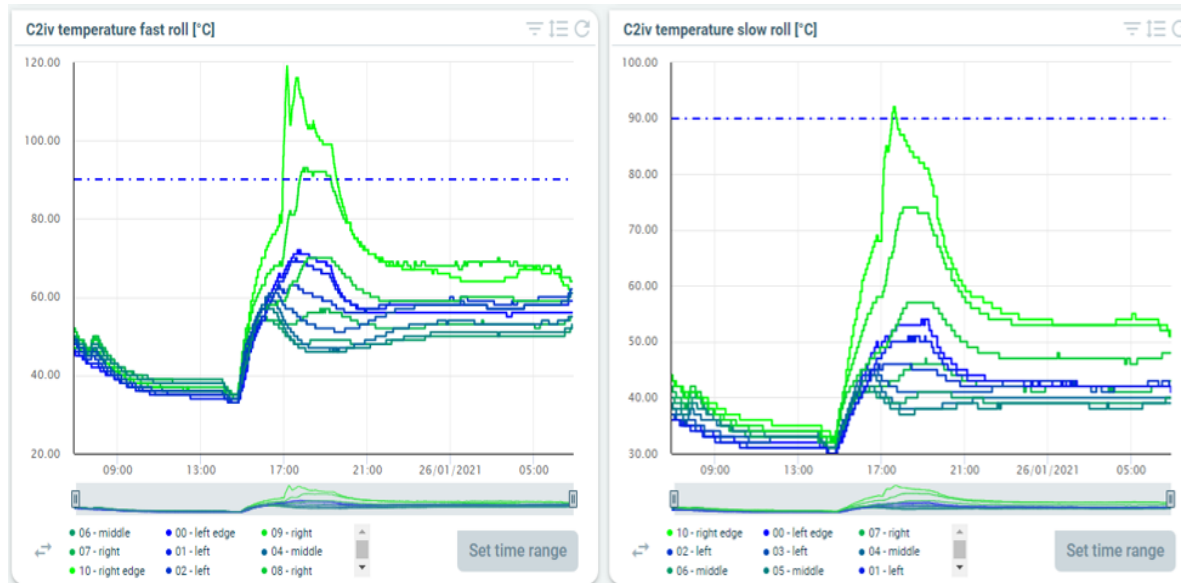
Over-temperature detection.

Impact

- Safety risk due to high temperature
- Damage of roll surface / machine
- Uneven granulation over roll length
- Unstable process, dry run possible
- Additional energy consumption

Actions

- Inspect passage for proper product feed and gap alignment
- Inspect the roll pack, including scraper knives



Temperature spike on smooth passage
→ Not recognized by the operator

Wrapping indication.

over-temperature
alarm



Impact

- Safety risk due to high temperature
- Uneven granulation over roll length
- Additional energy consumption

Actions

- Inspect passage for proper product feed and gap alignment
- Inspect the roll pack, including scraper knives

Over-temperature detection and alarm occurred.

→ Not recognized by the operator

How does this improve mill
performance

Think about how this can help Miller's around the globe...

- Temperature imbalance side-to-side.
- Temperature imbalance middle-to-side.
- Over-temperature detection.
- For Buhler and non-Buhler roller mills.
- Alarm when roll wrapping takes place.
- Vibration in suspend (automated detection coming soon).
- Touching scraper knife indication.

**Increased safety due to better operation monitoring.
... using data to solve problems.**

We transform milling.

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