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Efficiency Improvements Through Streamlining Maintenance Processes

Holger Streetz • Bathan AG • Switzerland

April 13th Track 1: Pellets & Densified Biomass

Technologies Available to Control Emissions at Biomass Power and Pellet Production Facilities

INTERNATIONAL BIOMASS CONFERENCE & EXPO
a BBI International event

April 11-14, 2016
Charlotte Convention Center
Charlotte, North Carolina

ALL THINGS BIOMASS

Agenda

1. General Information Bathan AG
2. Maintenance Planning
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    2. Maintenance Schedule and Tasks
3. Maintenance Optimization
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    2. Optimization Process
    3. Optimized Maintenance Plan
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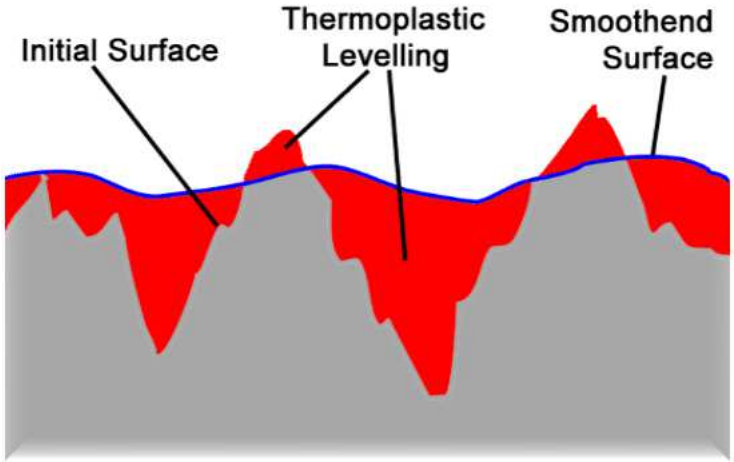
1. Bathan AG

Bathan AG's ceramic technology outpaces technology leaders in industrial lubrication. Under pressure, ceramic particles fill micro-cracks and, by thermoplastic levelling, smoothen friction peaks. Coated surfaces have lower friction and less wear.

- 95% reduced grease consumption
- temperature decrease
- longer lifetime of components
- lower risk of downtimes
- operating & maintenance cost reduction



2.1 Planning of Pellet Plants

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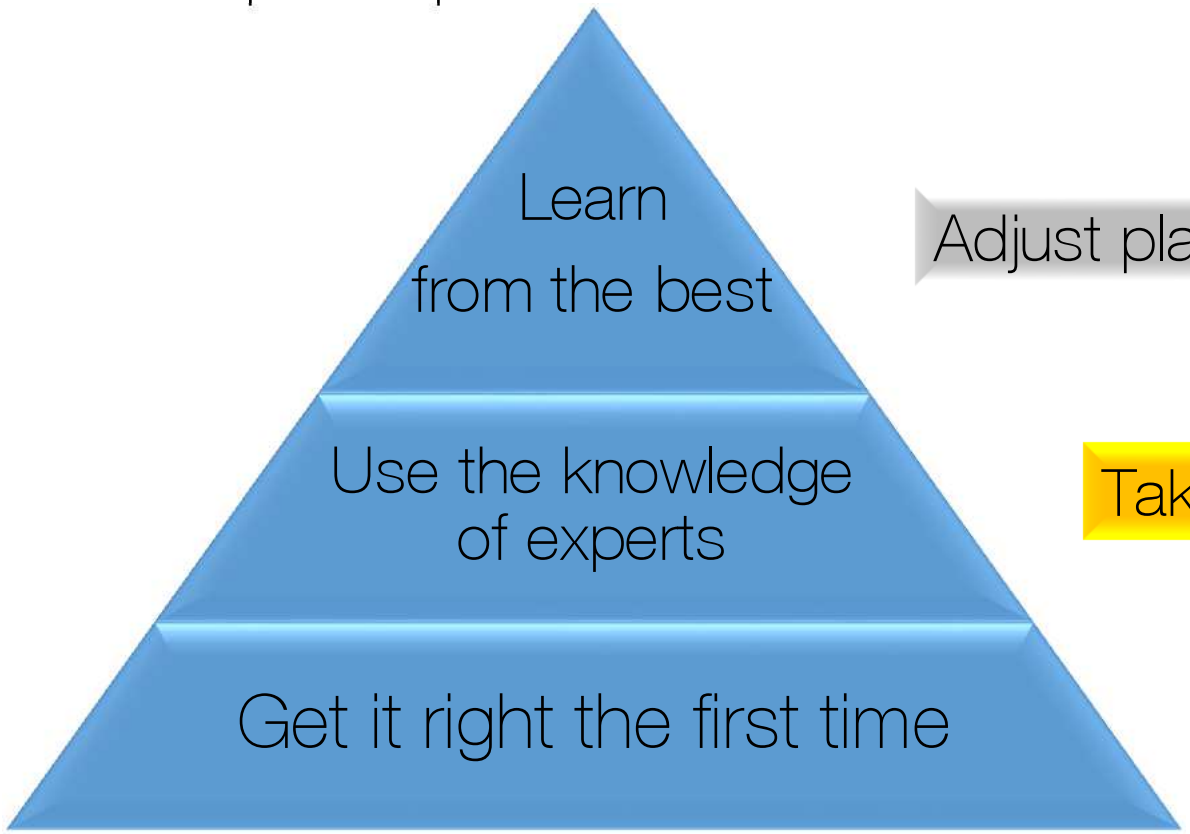
The goal is to produce wood pellets in adequate quality with an acceptable production rate at reasonable costs. Plant design is vital.



Adjust plant design if necessary

Take all aspects into account

Smart Maintenance starts with the plant design

2.2 Maintenance Schedule & Tasks

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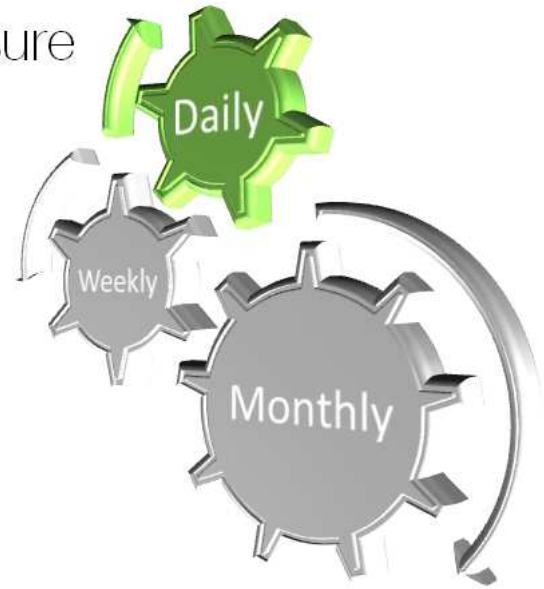
Daily check:

Moisture control	before moistening and after maturing vessel
Visual inspection of die	honeycombing, micro cracks, wear, foreign material
Visual inspection of rollers	adjustment, wear, temperature 120 to 150°C (250 to 300°F)
Grease pump control	fill level, grease pressure, air pressure
Gear control	oil pressure (1 to 5 bar), oil filter, oil cooler below 65°C (150°F), volume (oil level glass)
Quality control	pellet quality, abrasion, length, moisture, bulk weight, density



2.2 Maintenance Schedule & Tasks

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Weekly Check:

Hammer mill control	wear of sifters and hammers, clean magnet
Conditioner and feeder	clean thoroughly, check magnetic separator
Moisturizer control	check calibration, recalibrate if necessary
Pellet mill control	clean feed chutes and sifters, clean crumbler, collector, fan, exhaust, and roto shaker
Knifes	check sharpness

Control tonnage reports and hours run to plan maintenance.

2.2 Maintenance Schedule & Tasks

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Monthly check:

die and roller control	wear pattern, leakages, micro cracks, clearance
Gear control	wear, leakages, micro cracks, (belts if existing)
Conveyors control	lubrication, wear, belts
Other	e.g. lubrication pipelines, Oil and oil filter changes (according to manufacturer specifications)

Evaluate productivity and costs. Exercise die and roller change to ensure short maintenance downtimes!

3.1 Planned & unplanned Downtimes

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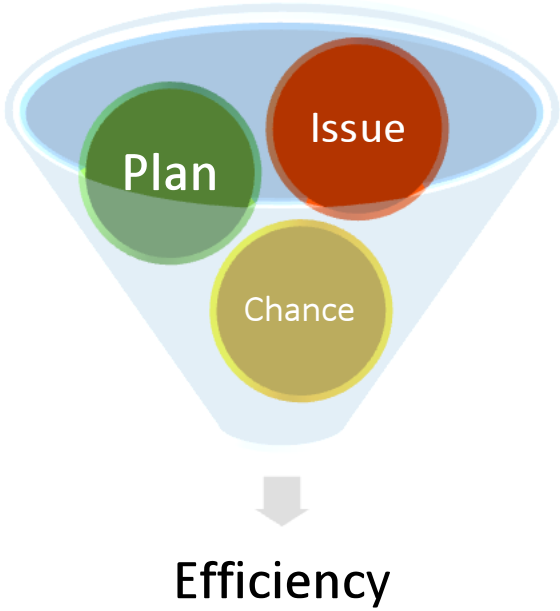
Downtimes are a bottle neck and an opportunity.



Planned Downtimes:

- Planned maintenance tasks
- Overhaul by service engineer

Unplanned Downtimes: ***depending on the reason***

- Failure → fix the problem
- Other (weather, material) → according to time available

3.2 Optimization Process

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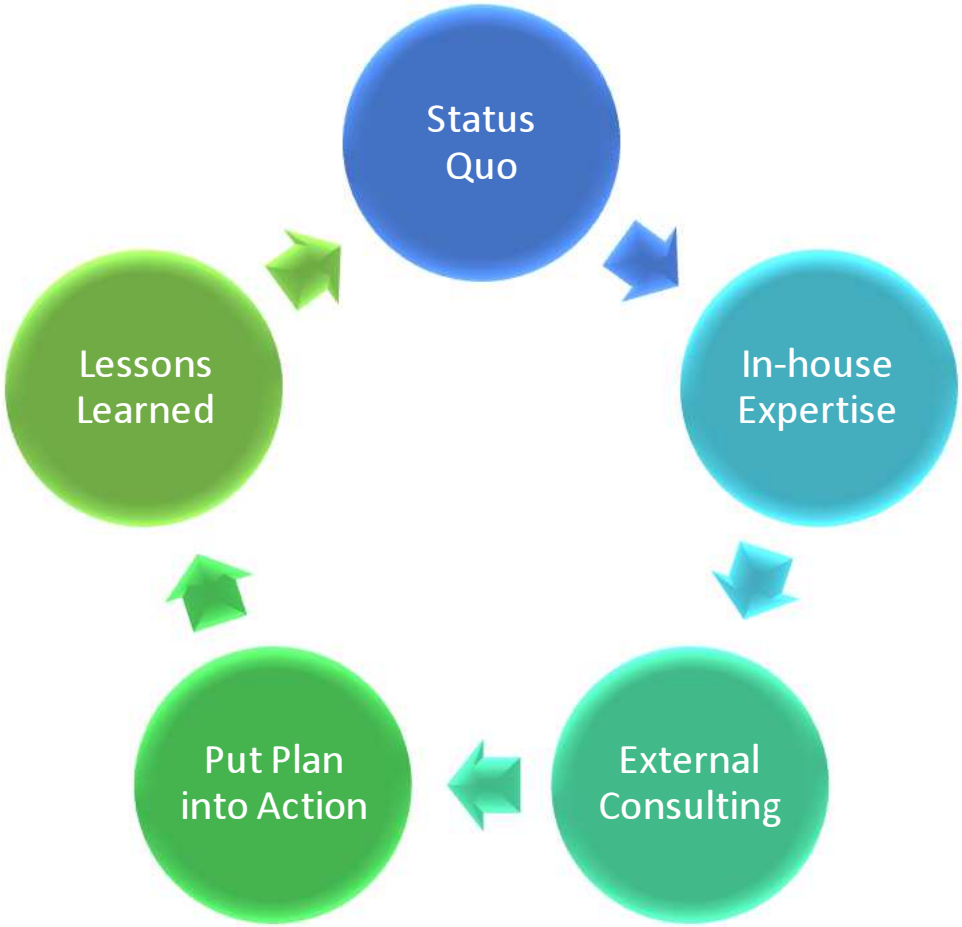

- By assessing the status quo, weaknesses become visible.
- Ask a third party to get a different perspective (organizational blindness).
- Work with your own team of experts to find opportunities, then ask other professionals.
- Put your plans into action!
- Implement a continuous optimization process to remain excellent.

3.3 Optimized Maintenance Plan

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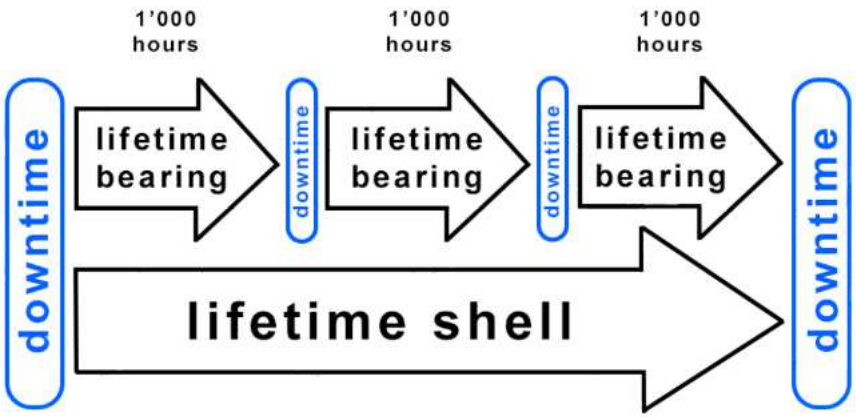
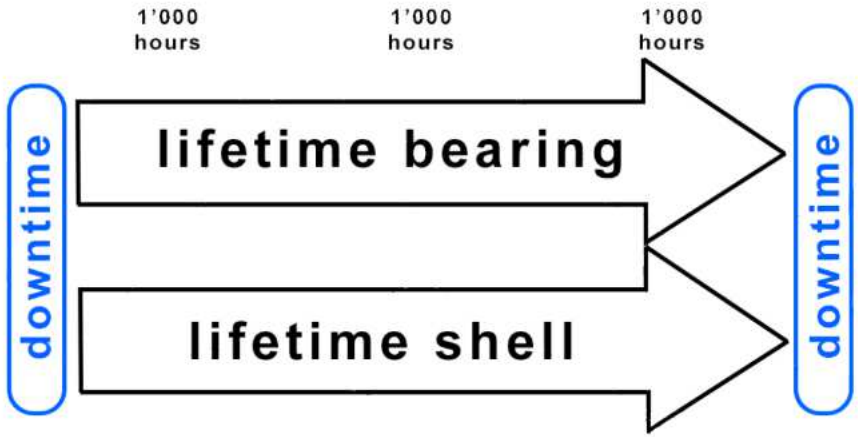
Paying attention to refurbishing rollers and using high-quality lubricants increases lifetime of components, and leads to efficient maintenance plans with less downtimes.

Tripling of bearing lifetime causes two fewer downtimes and decreases working hours and spare part costs.





4. Case Study 1 - Tschopp

Swiss Pellet Producer, CPM, 60'000t annual production

Status Quo:	1'000 operating hours lifetime of bearings Temperature Ø 115 °C (240 °F)
Changes:	Ceramic grease, new distance rings
Improvement:	95% less grease consumption up to 9'000 operating hours lifetime of bearings Temperature decrease by 10 °C (50 °F) Savings of approx. 100'000 CHF (100'000 $)

4. Case Study 2 – MAK Holz

Austrian Pellet Producer, CPM, 30‘000t annual production

Status Quo:	1’000 operating hours lifetime of bearings
Changes:	Ceramic grease, moving pre-lubrication of bearings, cautious assembly of dies and rollers, two piece die instead of one piece die
Improvement:	95% reduction in grease consumption Quadrupled lifetime of bearings Improved lifetime of die Savings of approx. 25’000 EUR (28’500 $)

4. Case Study 3 - Schwaiger

German HD-Pellet Producer, CPM, 200‘000t annual production

Status Quo:	1’200 operating hours lifetime of bearings
Changes:	Ceramic grease, rollers from Bathan AG and in-house refurbishing
Improvement:	95% less grease consumption
	4’000 operating hours lifetime of bearings
	Savings of approx. 125’000 EUR (140’000 $)

4. Case Study 4 – Schmidt Energie

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Austrian Pellet producer, CPM, 20'000 t annual production

Status Quo:	Very high grease consumption, 1'500 operating hours lifetime of bearings
Changes:	Ceramic grease, bearings from Bathan AG
Improvement:	95% less grease consumption 3'500 operating hours lifetime of bearings Savings of approx. 25'000 EUR (28'500 $)

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5. Conclusions

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- Preventative Maintenance is better than cure
- External professionals can offer a different perspective
- Attention to quality of roller refurbishment pays off
- High-quality lubricants help improve performance
- Even small changes can have a huge impact

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Thank You!

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