



Co-funded by the
Erasmus+ Programme
of the European Union



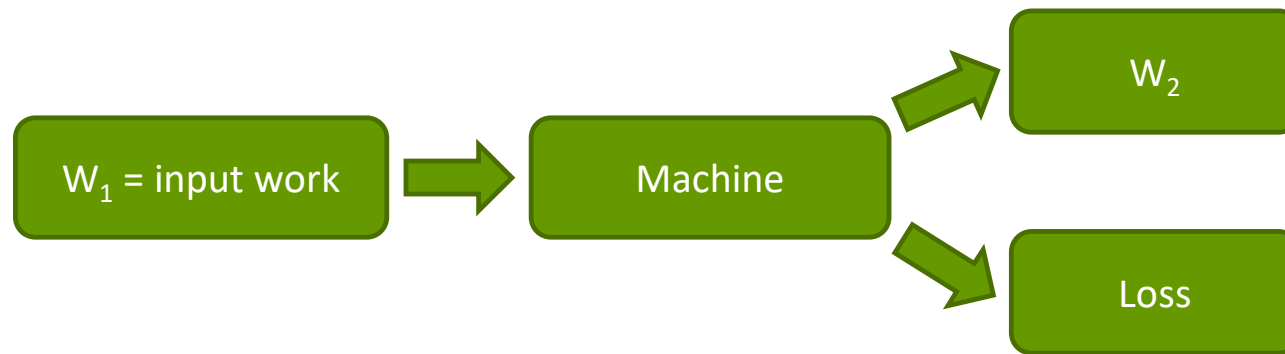
SAWMILLING OF WOOD



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption



- W_1 – input work
- W_2 - work done by the machine - useful work
- Power input (P_0) – input work per 1s (W)
- Power (P) – work done in 1s (W)
- Loss – the difference between input and output
- Efficiency (η)éeta – ratio between input and output



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption

Exercises:

1. The motor of the machine has an input of 950 W, its output is 720 W. What are its losses and efficiency?
2. The machine has an input of 450 W and its efficiency is 82%. How is its output? What work does it do in a minute?



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption

Motor stroje má příkon 950 W, jeho výkon je 720 W. Jaké jsou jeho ztráty a účinnost?

$$950 - 720 = 230 \text{ W}$$

$$720/950 = 0,76 \rightarrow 0,76 * 100 = \mathbf{76 \%}$$

2. Stroj má příkon 450 W a jeho účinnost je 82%. Jaký je jeho výkon? Jakou práci vykoná za minutu.

$$(450/100) * 82 = 369 \text{ W}$$

$$P = W/t \rightarrow W = P * t = 369 * 60 = \mathbf{22\ 140 \text{ J}}$$



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption



PowerQ and PowerQ plus
MI 2492

Measurement accuracy $\pm 3\%$



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption



Měřicí přístroj METREL Power Q plus MI 2392 (METREL, 2017)

PowerQ and PowerQ plus
MI 2492

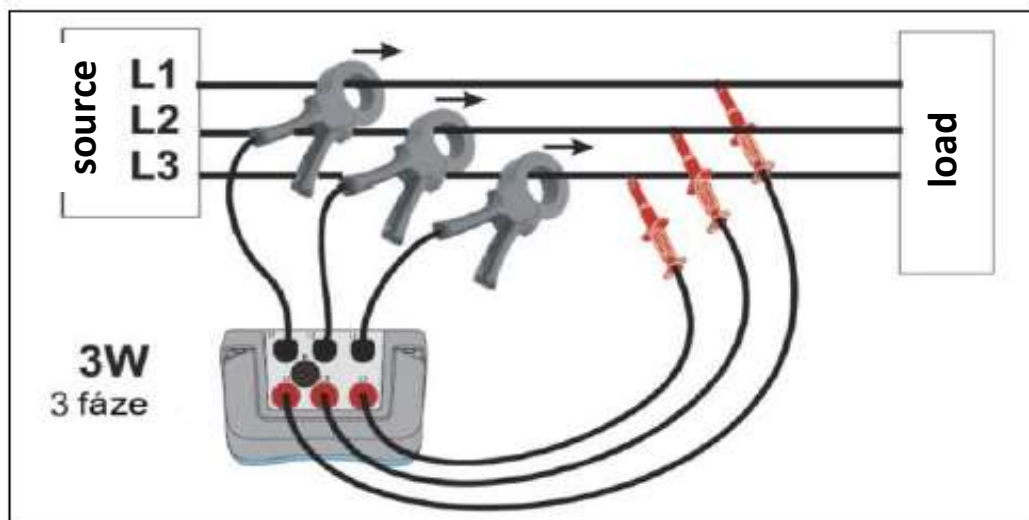
Measurement accuracy $\pm 3\%$



Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption



Zapojení přístroje METREL Power Q plus (METREL, 2017)

Engagement - 3 phase

One of the sensors is connected to each phase. The device measures the phase shift.



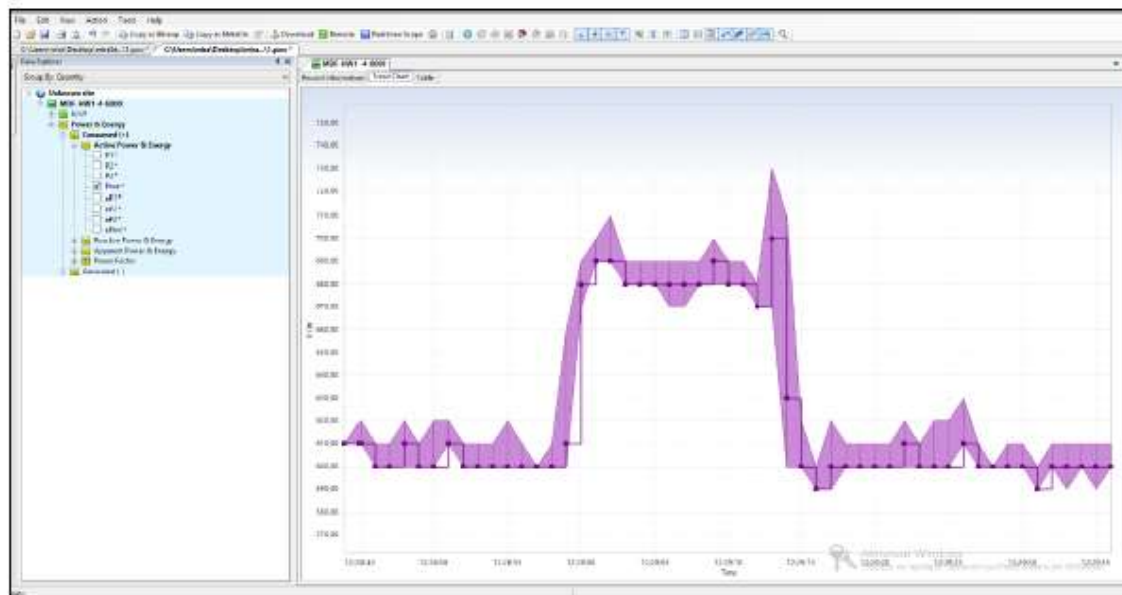
Co-funded by the
Erasmus+ Programme
of the European Union



Energy consumption

Output from the software.

An increase in electricity consumption can be seen. Measurement of
idle speed and in cut



Ukázka softwarového prostředí Metrel Power View



Co-funded by the
Erasmus+ Programme
of the European Union



THANKS FOR YOUR ATTENTION