

ANNEX C: Draft Guide Proposals – Energy Saving Estimates: Metal-Working MT, Stone & Ceramics Working MT: Policy Option 2, Ecodesign Mandatory "Points" Implementing Measure

The table below gives suggested energy savings by measure, but as already discussed in relation to Policy Option 2, the energy savings from multiple measures cannot simply be added together in a linear way.

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
Design for instant machining without warm-up	1.0%		3	Definition requires additional information to allow clear assessment
Work piece clamping and tool clamping	1%		3	Definition requires additional information to allow clear assessment
Multi spindle-/ multi work pieces machining	5%		4	No clear definition provided
Complete machining all sides	1%		3	No clear definition provided
Combination of various technologies (turning + milling + laser + grinding etc.)	5%		4	This is a measurable action
Axis clamping			2	Not part of the EuP study - similar technology to work piece clamping

¹ Best estimates of report project team. Further verification of energy savings by additional experts would be useful.

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
Drive Units				
Regenerative feedback of inverter system (e.g. servo motor/spindle)	0.5%	10%	3	CECIMO estimate for component improvement and not the whole MT
Use of energy efficient motors for auxiliary units	1.0%	12%	2	CECIMO estimate for component improvement and not the whole MT
Use of energy efficient motors for intelligent magnetic flux control			2	Not part of the EuP study - no clear definition provided
Mass free compensation of load for vertical axes	1.0%		2	
Use of break for non-moving axes	0.5%	3%	2	
Inverter system with high efficient power device			3	Not part of the EuP study
Higher voltage inverter systems (e.g. 400V) to substitute 200V systems (where applicable)	1.0%	15%	2	CECIMO estimate for component improvement and not the whole MT. Requires infrastructure change beyond product
Hydraulic System				
Discontinuous operating pumps	1.0%		2	Not part of ISO standard, but is an auditable action
Speed controlled	1.0%		2	Not part of ISO

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
pumps				standard, but is an auditable action
Fixed orifice blades to control the system pressure	0.5%		1	Not part of ISO standard, but is an auditable action
Pneumatic systems				
Selection of optimal drive subsystem (motor-pump - Different function sequences create the need for pump system)			3	Not part of the EuP study, and the definition is not clear
- Single master switch-off	1%		2	Is an auditable action
- Individual switch-off capability for specific modules	1%		3	Is an auditable action
- Intelligent shut down procedures	3%		4	Is an auditable action
- Leak indicator, on demand monitoring	1%		3	Is an auditable action
Directed switch off of not needed branches			2	Not part of the EuP study, but is an auditable action
Directed switch off			2	Not part of the EuP study, but is an auditable action
ISO 4414 shall be applied			1	Not part of the EuP study, but is an auditable action
Electric systems				

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
Converter with power factor correction	1%		2	Is an auditable action
Thermal management regarding control cabinet			2	Not part of the EuP study, but is an auditable action
Cooling lubrication system				
Discontinuous operating pumps	0.5%		2	
Minimal quantity lubrication (MQL) when advantage	0.5%		2	
Adjustable pressure for cooling lubrication	0.5%		1	Not part of the ISO standard, but is an auditable action and could potentially be included
Controlled flow rate	1.0%		1	Not part of the ISO standard, but is an auditable action and could potentially be included
Inverter controlled motors for lubrication system	0.5%		1	Not part of the ISO standard, but is an auditable action and could potentially be included
Cooling system				
Demand dependent cooling			3	Not part of the EuP study, but is an auditable action
Power electronics				

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
Avoidance of transformers by use of voltage-proof converter	0.5%		2	Not part of the ISO standard, but is an auditable action and could potentially be included
High efficiency transformer	0.5%		2	Not part of the ISO standard, but is an auditable action. Cannot be combined with 8.1
Controlled switching power supply for auxiliary power 24V	0.5%		2	Not part of the ISO standard, but is an auditable action and could potentially be included
Machine concept				
Thermal management regarding control cabinet	0.5%		2	Not part of ISO standard, and definition is not clearly defined
Switching valves with low Watt technology / alternative control via use pulse width modulation (PWM)	0.5%		2	Not part of the ISO standard, but is an auditable action and could potentially be included
Peripheral devices				
Demand depending controlled peripherals (devices like mist extraction, chip conveyor, etc)	1.0%		2	Is an auditable action, but definition is imprecise
Control systems				
Setting for operating condition	0.5%		2	

Measure	EuP estimate	CECIMO estimate	Suggested machine energy saving to be ascribed to measure (%) ¹	Comments
(customer specific unit switch-off, e.g. screen saver for operating terminal and work space lighting to be switched-off when not in use)				
Automatic operating state switching	1%		2	Is an auditable action, but definition is imprecise