



Material Use

Turbines

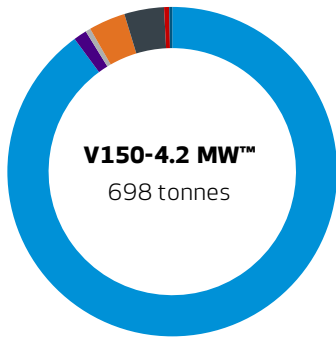


By knowing how Vestas' products and materials contribute to the environmental performance of the wind plant, it is possible to make fact-based and informed decisions that will minimise overall environmental impacts. Life Cycle Assessment is used to provide the detailed knowledge regarding the material composition of the wind plant.

The figures on the following pages show the typical material breakdown of Vestas' turbines.

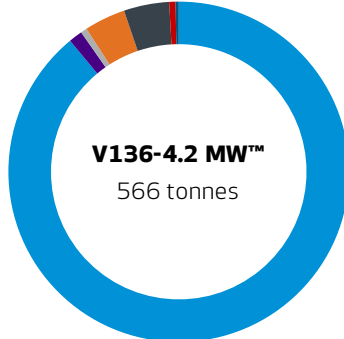
For example, a V136-3.45 MW[®] turbine is composed of around 89% metals (e.g. steel, iron, copper and aluminium), 8% polymers and composite materials, and the remainder a mixture of electronics/electrical items, lubricants and fluids, etc.

4 MW Platform Turbines



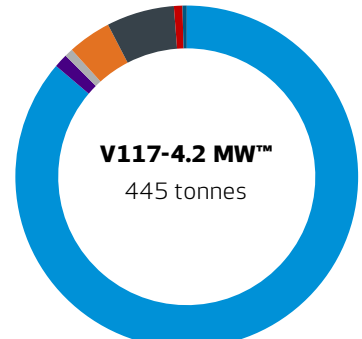
- Steel and iron materials 90%
- Aluminium and alloys 1.3%
- Copper and alloys 0.5%
- Polymer materials 3.6%
- Glass / carbon composites 3.9%
- Electronics / electrics 0.5%
- Lubricant and fluids 0.3%
- Not specified 0.0%

Note: 155m hub height and wind class IEC3B



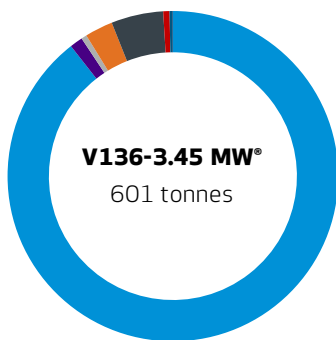
- Steel and iron materials 89%
- Aluminium and alloys 1.3%
- Copper and alloys 0.6%
- Polymer materials 3.9%
- Glass / carbon composites 4.3%
- Electronics / electrics 0.6%
- Lubricant and fluids 0.3%
- Not specified 0.0%

Note: 112m hub height and wind class IEC2B



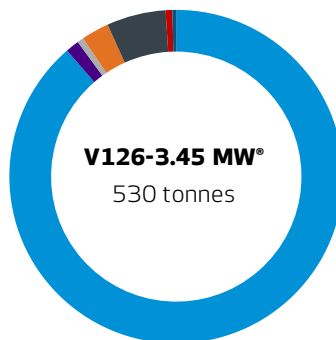
- Steel and iron materials 86%
- Aluminium and alloys 1.3%
- Copper and alloys 0.8%
- Polymer materials 4.1%
- Glass / carbon composites 6.4%
- Electronics / electrics 0.6%
- Lubricant and fluids 0.3%
- Not specified 0.0%

Note: 91.5m hub height and wind class IEC1B



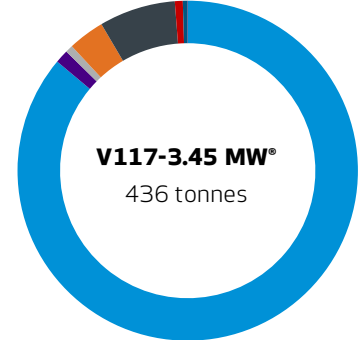
- Steel and iron materials 89%
- Aluminium and alloys 1.3%
- Copper and alloys 0.5%
- Polymer materials 2.7%
- Glass / carbon composites 5.1%
- Electronics / electrics 0.6%
- Lubricant and fluids 0.3%
- Not specified 0.0%

Note: 132m hub height and wind class IEC3A



- Steel and iron materials 89%
- Aluminium and alloys 1.3%
- Copper and alloys 0.6%
- Polymer materials 2.7%
- Glass / carbon composites 5.7%
- Electronics / electrics 0.7%
- Lubricant and fluids 0.4%
- Not specified 0.0%

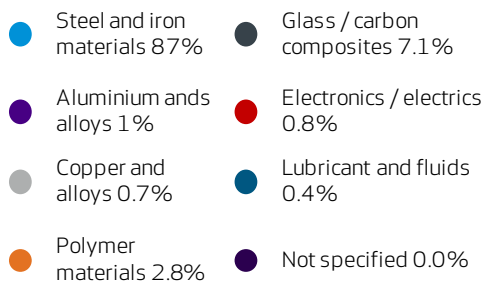
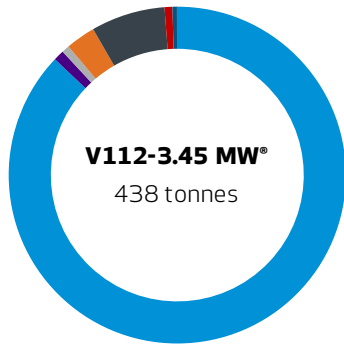
Note: 117m hub height and wind class IEC2A



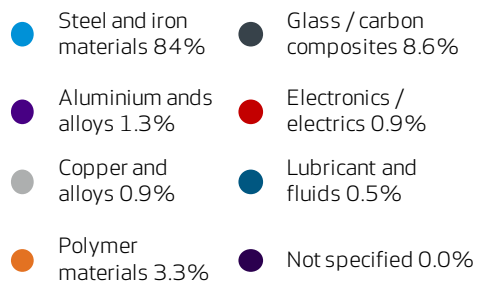
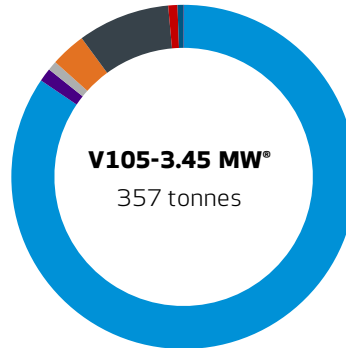
- Steel and iron materials 86%
- Aluminium and alloys 1.3%
- Copper and alloys 0.7%
- Polymer materials 2.8%
- Glass / carbon composites 7.3%
- Electronics / electrics 0.8%
- Lubricant and fluids 0.4%
- Not specified 0.0%

Note: 91.5m hub height and wind class IEC1B

4 MW Platform Turbines

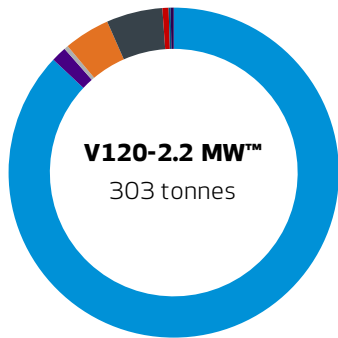


Note: 94m hub height and wind class IEC1A



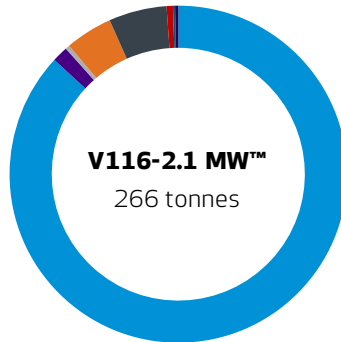
Note: 72.5m hub height and wind class IEC1A

2 MW Platform Turbines



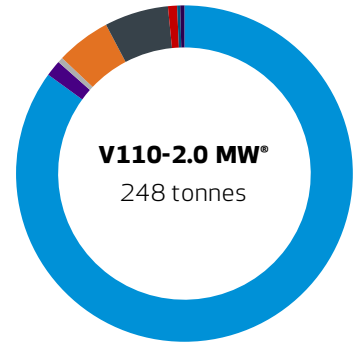
- Steel and iron materials 87%
- Aluminium and alloys 1.5%
- Copper and alloys 0.4%
- Polymer materials 4.5%
- Glass / carbon composites 5.5%
- Electronics / electrics 0.6%
- Lubricant and fluids 0.2%
- Not specified 0.3%

Note: 110m hub height and wind class IEC3



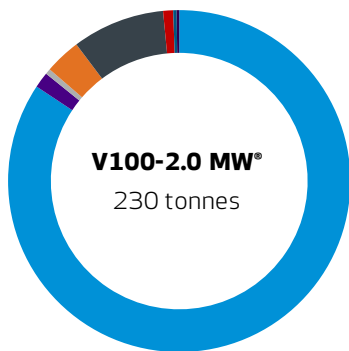
- Steel and iron materials 86%
- Aluminium and alloys 1.5%
- Copper and alloys 0.4%
- Polymer materials 4.5%
- Glass / carbon composites 5.5%
- Electronics / electrics 0.6%
- Lubricant and fluids 0.2%
- Not specified 0.3%

Note: 94m hub height and wind class IEC3



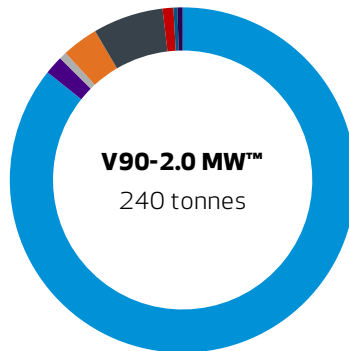
- Steel and iron materials 85%
- Aluminium and alloys 1.5%
- Copper and alloys 0.5%
- Polymer materials 5.2%
- Glass / carbon composites 6.1%
- Electronics / electrics 0.9%
- Lubricant and fluids 0.3%
- Not specified 0.4%

Note: 80m hub height and wind class IEC3A



- Steel and iron materials 84%
- Aluminium and alloys 1.5%
- Copper and alloys 0.5%
- Polymer materials 3.4%
- Glass / carbon composites 8.7%
- Electronics / electrics 0.9%
- Lubricant and fluids 0.3%
- Not specified 0.2%

Note: 80m hub height and wind class IEC2B



- Steel and iron materials 86%
- Aluminium and alloys 1.7%
- Copper and alloys 0.7%
- Polymer materials 3.4%
- Glass / carbon composites 6.6%
- Electronics / electrics 1%
- Lubricant and fluids 0.4%
- Not specified 0.5%

Note: 80m hub height and wind class IEC3A

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