

## Appendix B: Scenario uncertainty in calculating emissions from the use of sold products

**S**enario uncertainty assessment (also known as sensitivity analysis) is a useful tool to understand how changes in the product's design, use, and disposal could impact inventory results. It can be thought of as the impact of potential situations other than the conditions and assumptions made in the product's inventory results and report.

### Example [B.1] Scenario analysis: measuring uncertainty in calculating emissions from the use of sold products

Company A produces electric fans for residential consumers. The electric fan has a wattage of 300. Company data indicates that consumers use the electric fan an average of 40 days a year, with an average use of 6 hours/day for a total of 5 years of use before disposing of the fan.

#### To calculate use-phase emissions, the company made the following calculations:

total lifetime usage =  $40 \times 6 \times 5 = 1,200$  hours

CO<sub>2</sub>e emissions per hour of use = wattage x electricity grid factor =  $300 \times 0.45 = 0.135$  kg CO<sub>2</sub>e/hour use

the company sold 1,000 units in the reporting year, so total use-phase emissions for the reporting company  
=  $1,200 \times 0.135 \times 1,000 = 162,000$  kg CO<sub>2</sub>e = 162 tonnes CO<sub>2</sub>e

**Example [B.1] Scenario analysis: measuring uncertainty in calculating emissions from the use of sold products (continued)**

For both the reporting company and stakeholders, it may be valuable to understand how a change in the use pattern would change the inventory results. Company A has defined the average usage scenario in situation 1. However, based on research the company conducted, the number of days that the electric fan is used could range between 20 and 60 per year, and the lifespan of the fan could range from 5 to 8 years.

To understand the impacts of the use phase of the electric fan in these different scenarios, four hypothetical scenarios were developed based on the range of use days per year and the range of life span. Total use-phase emissions were then calculated for each scenario.

Situation	Use days/year	Use hours/day	Use lifespan (years)
1	40	6	5
2	60	6	5
3	60	6	8
4	20	6	5
5	20	6	8

**Electric fan use-phase emissions under different use situations**



As shown in the table and graph above, different scenarios show different use phase emissions. The scenario uncertainty analysis helps the reporting company ensure that the scenario used in the inventory is representative of the range of scenarios, and not the scenario with the lowest emissions.

If the scenario uncertainty shows a very large range in emissions, and if this range is significant relative to total scope 3 emissions, companies may choose to conduct more detailed analysis of the use profile of the product to more accurately calculate use-phase emissions and reduce the uncertainty.