

Repair or replace? Extending the life-span of your home appliances – FAQs and helpful hints

The manufacturing of electrical and electronic appliances consumes energy and resources. Modern home appliances with built-in electronics contain metals such as tin, tantalum, gold and copper. In many cases, the mining of these raw materials causes major environmental damage and is linked to violations of fundamental human rights in the developing countries and emerging economies. Manufacturing a washing machine or other home appliance is energy-intensive and thus produces greenhouse gas emissions, which contribute to global warming. The disposal of these products is also problematical as they contain harmful substances which pose a risk to the environment and human health; these risks are particularly severe in the developing countries and emerging economies. Keeping home appliances in service for longer can generally help to minimise these harmful impacts on the climate and the environment.

In 2016, the Oeko-Institut conducted various studies on obsolescence, which showed that strategies to discourage people from discarding their appliances prematurely are a task for the whole of society and will only be successful if policy-makers, manufacturers and consumers work together. But policy-makers and industry still have much to do; this includes establishing a better repair infrastructure, setting minimum product quality and durability standards, creating more effective statutory and financial safeguards, such as legal warranties and guarantees, and offering tax relief on long-lasting, easy-to-repair products as a measure to counter premature obsolescence. However, consumers also have a role to play: by choosing long-lasting, easy-to-repair products, they can actively shift consumption patterns towards more sustainability.

How can appliances be kept in service for as long as possible? When are they worth repairing – and when does it make sense to buy a new and efficient appliance? The Oeko-Institut provides answers to these questions in this background paper.

FAQs: an overview

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1. FAQs and helpful hints on extending the life of your home appliances

1.1. How do I identify durable products?

At present, there is little practical information available at the point-of-sale or online to help consumers identify durable products quickly and easily. The following tips can help you make the right choice:

When buying a new product

- Look at the price. This is often a good indicator of a product's durability. Long-lasting products are generally more expensive.
- Look at the guarantee period and think about having an extended warranty for the appliance itself or for critical components. But before you decide to spend money on an extended warranty, check which types of repair are covered.
- Buy products that display the Blue Angel ecolabel: it is awarded for product features such as durability, availability of spare parts and ease of repair.
- Look at the manufacturer's repair and maintenance offer, particularly the aftercare service provided by the customer service centre and the availability of spare parts. Consult a specialist dealer or visit the manufacturer's website.
- Focus particularly on firms/brands which highlight the durability of their products in their marketing.
- Always buy low-energy appliances with the highest energy efficiency rating in their product category.
- Buy appliances of a size that suits your needs: this usually means as small as possible.

If your existing product develops a fault

- For certain types of product (see Section 2): before you decide to buy a new appliance, check whether your existing model can be repaired. A repair is almost always the more eco-friendly option and is often cheaper, especially for high-end appliances.
- If the guarantee or legal warranty period has expired, it is worth contacting an independent repairer to find out how much a repair would cost. This may be cheaper than having it repaired by the manufacturer's customer service centre.
- Check to see if you can carry out smaller repairs yourself. Refer to the user's manual or, alternatively, visit a Repair Café.

High-end, high-efficiency second-hand goods with a dealer's warranty are an alternative to buying a new product. This avoids the consumption of resources in the manufacturing of new products.

1.2. Are durable products always more expensive?

Product durability quite rightly comes at a price. Ambitious quality management generates high costs – for research and development, good-quality materials and components, supplier control, full

service life testing, maintaining availability of spare parts and so forth – all of which pushes up the price of these products. As a result, durable appliances are often more expensive.

These quality assurance measures are necessary in order to minimise the probability of components and parts developing faults during the product's intended lifespan. The service life testing carried out by the German consumer organisation, Stiftung Warentest, has also confirmed that cheaper appliances tend to develop faults more frequently than their more expensive counterparts. Stiftung Warentest demonstrated this by testing washing machines. It found that the failure rate for washing machines with a purchase price of less than 550 euros was three times higher after 10 years compared to machines that cost 700 euros or more (Stiftung Warentest 2013).

1.3. Does higher price guarantee durability?

Of course, expensive appliances can occasionally develop faults when they are still comparatively new. One reason is that it is not technically feasible to reduce the probability of failure to zero per cent within any product's intended lifespan. Even high-end appliances which meet ambitious quality standards may fail prematurely in some instances, and theoretically, this can affect any consumer. What is certain, however, is that this occurs more rarely than with cheaper appliances. Apart from this, there are undoubtedly some isolated examples of appliances whose high price is not matched by their quality. We therefore recommend that before you make your purchase, you ask around – talk to friends and family, visit online forums and read the quality reviews by independent bodies such as Stiftung Warentest to find out about others' experiences with specific products and brands.

If you are willing to pay a higher price and decide to buy a durable product, you should choose appliances (or at least any components that are prone to wear and tear, e.g. the battery, motor, electronics or pump) with longer-than-average guarantee periods. Also look at the manufacturer's repair and maintenance offer, particularly the aftercare service provided by the customer service centre and the availability of spare parts. It is frustrating to find that your high-price appliances cannot be repaired, especially as this is often the most economical and environmentally friendly option.

1.4. Does the product's durability depend solely on the price?

A product's durability depends not only on price but also on how intensively and carefully it is used. If an appliance is used far more intensively than its design allows, it is likely to break down before it reaches the end of its intended lifespan – perhaps several years too early. Conversely, budget appliances that are rarely used (e.g. electric drills, which tend only to be used occasionally) may well last for several years. However, a cheaper product that is in frequent use (e.g. a budget power drill that is used intensively several times a week) is more likely to develop a fault earlier as it is not designed to withstand this level of use. In such cases, we would recommend buying a higher-quality product, even though this increases the initial purchasing costs. So before buying a new product, it is worth giving some thought to your own user behaviour and then consulting a reputable dealer. This will help you choose a product that meets your needs.

In 2013, Stiftung Warentest identified minimum price thresholds for selected products. It advises against purchasing the following: hand blenders costing less than 20 euros, juicers under 60 euros, vacuum cleaners under 80 euros, jigsaws and hand-held circular saws under 50 euros and cordless drills under 50 euros.

1.5. From the consumer's point of view, isn't it more economical to buy a new product to replace an appliance that is faulty or in need of repair?

For **environmental reasons**, it is advisable in most cases to have faulty appliances repaired and to keep them in service for as long as possible. This saves the energy and resources that would otherwise be consumed in the manufacturing of new products. Whether repairing an appliance offers **value for money** depends on the specific case:

With high-end appliances, a repair is often more economical than a new purchase. With budget appliances, the repair costs are often high relative to the costs of purchasing an equivalent new product, so the consumer is more likely to buy a new appliance than have the old one repaired. We therefore recommend buying higher-quality, durable and easy-to-repair appliances from the outset.

Whether a repair is the economical option also depends on how long the appliance has been in service. If a fault occurs in a high-end appliance after just a few years, having it repaired to keep it in service is generally the more favourable option. However, if a faulty appliance is close to the end of its expected lifetime, it may be better to replace it with a new, energy-efficient, high-quality model.

Read our [product recommendations](#) to find out when repairing a specific product is best for your budget and the environment.

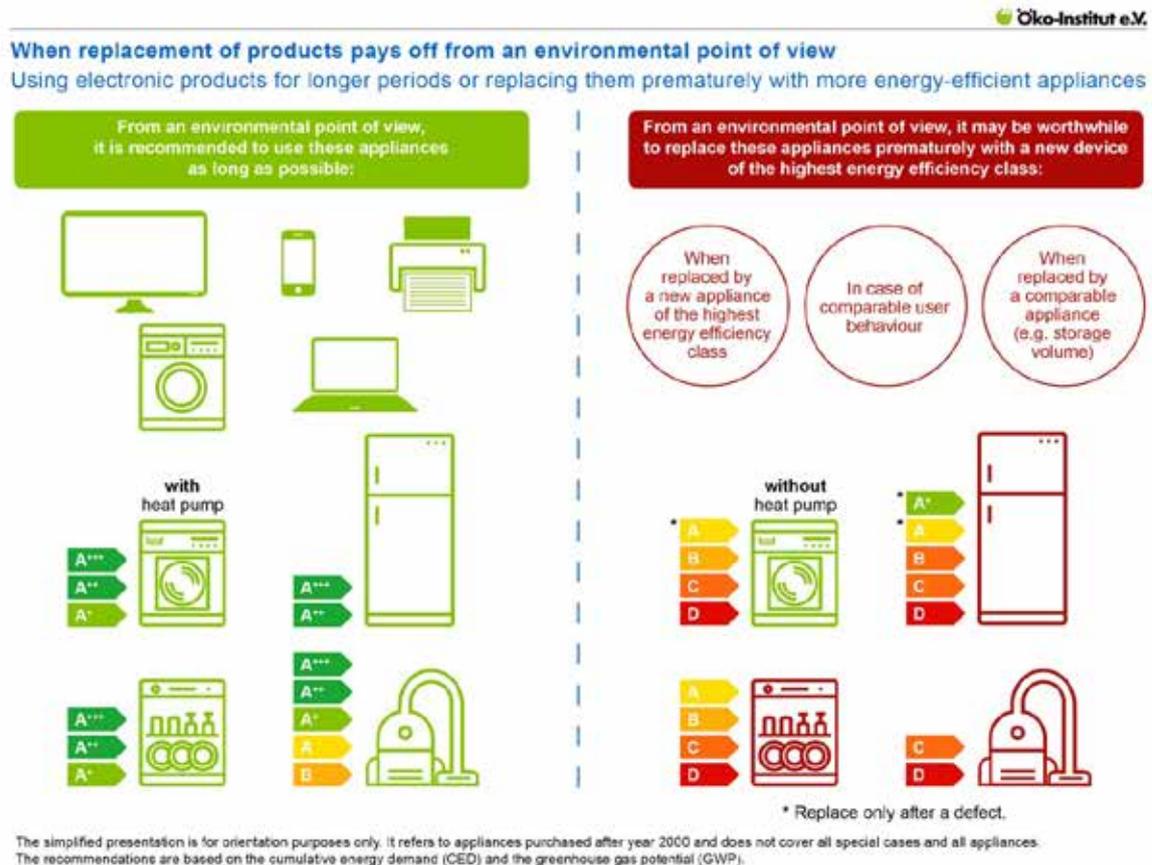
1.6. Are durable products always more eco-friendly, especially if new products are significantly more efficient?

For a long time, the energy-saving message was that consumers should buy a new and more energy-efficient appliance once their existing product had been in service for a few years. For types of product whose efficiency improved rapidly over a short time period, this undoubtedly made sense. However, the energy efficiency of a wide range of appliances has improved substantially in recent years, mainly as a result of the EU's Energy Labelling and Ecodesign Directives. Consumers who already own an energy-efficient appliance should therefore keep it in service for as long as possible in order to minimise its environmental impact.

In general, it will depend on the specific product whether extending its life-span and keeping it in service – for example, by having it repaired – is the more eco-friendly option or not. Differences in energy efficiency between the new appliance and the model being replaced, the inputs required for manufacturing the new appliance and real-world consumer behaviour - all play a significant role. Of course, if buying a new appliance is the only option, it is always best to choose a product with the highest energy efficiency. However, the situation is rather different if the existing product is still in good working order.

The following diagram shows which appliances, from an environmental perspective, should **remain in service for as long as possible**. They include: computers, laptops and smartphones, washing machines, high-efficiency heat-pump tumble dryers, and appliances such as fridges, dishwashers and vacuum cleaners (shown in green), which are already highly efficient. With the other appliances (shown in red), buying a new appliance sooner rather than later is generally the more eco-friendly option. However, when replacing an older product that is still in good working order, it is important to check that the new model has the highest energy rating, is not oversized and has low energy consumption in absolute terms.

Figure 1: Using products longer or replacing them?



SOURCE: Oeko-INSTITUT 2018

Source: Oeko-Institut, 2018

Numerous studies on products such as notebooks and washing machines show that a long-lasting appliance is generally more eco-friendly – despite advances in energy efficiency. **Notebooks are an example:** in a study for the German Federal Environment Agency (UBA), the Oeko-Institut calculated that even if the new notebook uses around 10 per cent less energy than the old one, it would have to remain in service for around 80 years in order to compensate for the energy consumed in its manufacture. From an environmental perspective, it also makes sense to keep other electronic devices, such as TVs and smartphones, in service for as long as possible.

Even with **fridges**, you should keep your new and efficient appliance (A++ to A+++ energy rating) in service for as long as possible. Have it repaired, as no major advances in energy efficiency are anticipated in the near future. If your fridge with energy efficiency classes A+ or A develops a major fault that is expensive to repair, you could replace it with a new top-rated model (A+++). What should you do if you purchased your fridge in or before 2000, or if it has a B energy rating or lower? In this instance, the eco-friendly option – in terms of cumulative energy demand (CED) and global warming potential (GWP) – is to replace it with a new top-rated appliance (A+++).

[Please see Section 2 for other product group information.](#)

1.7. Disposal: getting it right

As a consumer, you are obliged, under the German [Electrical and Electronic Equipment Act \(ElektroG\)](#), to dispose of your discarded appliances separately from your domestic waste. One option is to hand it in at a municipal collection centre free of charge. Some local authorities also arrange collection, for example as part of their bulky waste disposal service. Alternatively, you can use a takeback system run by manufacturers or distributors of electrical and electronic equipment. There are other options: retailers with an electricals/electronics sales area of at least 400 square metres are obliged to take back your old appliance free of charge if you buy a new product of a similar type (like-for-like takeback). Energy-efficient appliances that are still in good working order can be passed on for reuse via used goods marketplaces or second-hand shops.

1.8. Consumer rights: keeping your appliances in service for longer

Various items of consumer legislation are in force to help you extend your product's useful life. Know your rights – it pays off, not only financially but also in terms of sustainability.

[The Oeko-Institut's background paper "What are my rights if I want my product to have a longer useful life?"](#) also offers a comprehensive overview of consumer rights.

2. Repair or replace? Product-specific recommendations

2.1. Washing machines

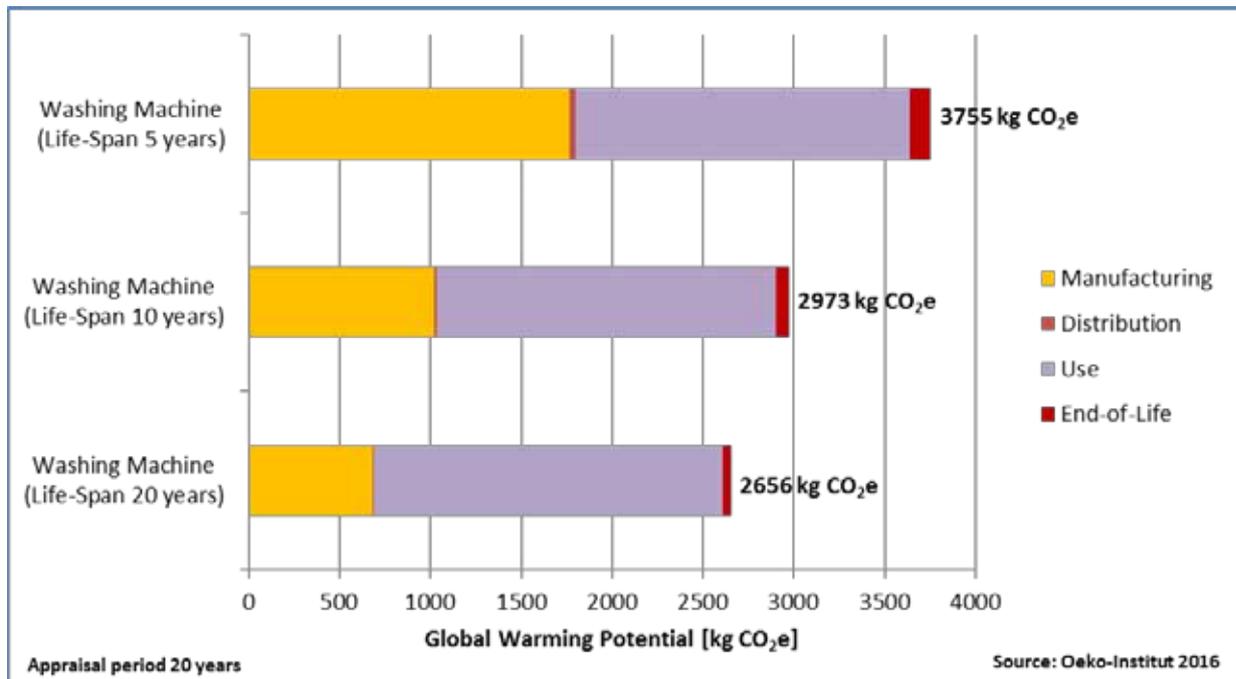
Is repairing a faulty washing machine the eco-friendly option?

Yes, extending a washing machine's life by having it repaired is the right choice for the environment. The reason is that the manufacturing of modern washing machines has major environmental impacts, partly because of their built-in electronics. Stiftung Warentest (2017) explains: *"A consumer who buys a new washing machine whenever their old one develops a fault leaves a much larger environmental footprint than a consumer who has their current model repaired."*

Is it worth buying a washing machine that is durable but more resource-intensive to manufacture?

Yes, definitely. In a life cycle analysis conducted in 2016, the Oeko-Institut made two assumptions: that the follow-on generation of washing machines would be more energy-efficient. Furthermore, it was assumed that a durable washing machine, due to its robustness and higher quality, would be more resource-intensive to manufacture than a model with a shorter lifespan. Despite these relatively unfavourable assumptions for the durable machines, they still produced almost 1,100 kg less greenhouse gas emissions over the 20-year appraisal period than models with a shorter lifespan (Figure 3).

Figure 3: Global warming potential of washing machines with short and long lifespans: a comparison (appraisal period: 20 years)



Source: Oeko-Institut 2016

Does a premature replacement of a washing machine that is still in good working order deliver any environmental benefits?

Recent research studies, including some by the Oeko-Institut, show that replacing a modern, energy-efficient washing machine that is still in good working order offers no environmental benefits whatsoever. So if you have bought an energy-efficient washing machine in the last few years, you should keep it in service for as long as possible. If it develops a fault, have it repaired to extend its useful life.

Studies by the Oeko-Institut also show that the ecological payback time (i.e. the time period until an appliance compensates for the environmental cost of its own manufacture and begins to make a positive contribution to the environment) for the replacement of a washing machine that was manufactured in 2000 and is still in good working order is around 40 years in terms of its global warming potential (GWP) – much longer than the expected lifetime of a modern washing machine.

There are two reasons for this:

1. The upstream supply chains which provide the inputs for the manufacturing process generate significant environmental impacts. Depending on the lifespan achieved, manufacturing accounts for between 25 and 50 per cent of a washing machine's total environmental impacts. The shorter the lifespan, the higher the share of environmental impacts from its manufacture.
2. Due to the introduction of energy efficiency regulations and technical innovations, the water and energy efficiency of washing machines has substantially improved in recent years. As a result, no major energy efficiency increases are anticipated in the near future. This means that energy savings achieved through the use of new and even more efficient

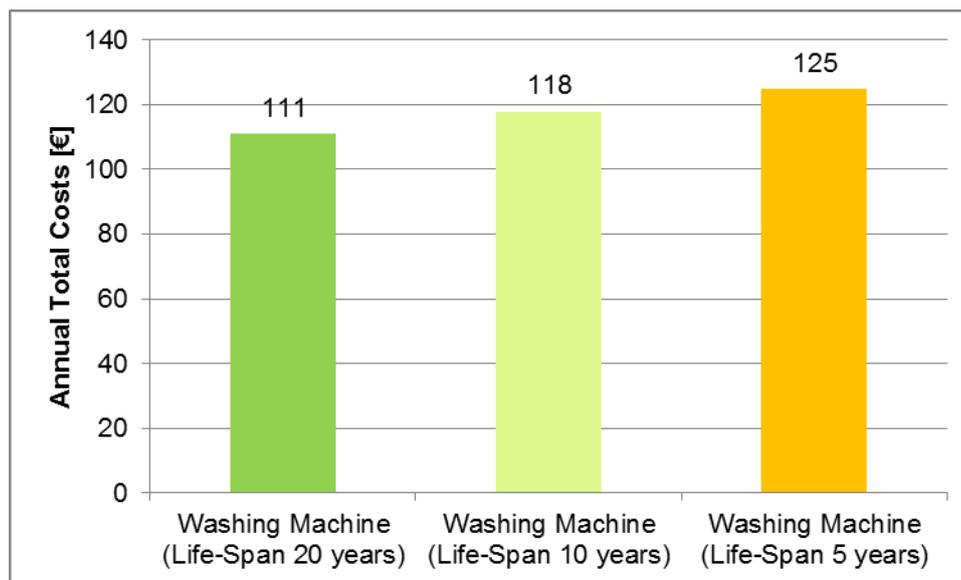
appliances cannot compensate for the major environmental impacts associated with manufacture.

As a consumer, you yourself can do **most to save energy** when using your washing machine. Choose a low-temperature wash, use energy-saving programmes and only run the machine with a full load. You can find other energy-saving tips at www.ecotopten.de.

In view of the high repair costs and rising electricity prices, is it economical to repair an older model that has developed a fault? Surely it would be much more sensible to buy a new, energy-efficient washing machine – isn't that better for my budget?

Of course, if the only option is to buy a new washing machine, it is always best to choose a high-efficiency model. However, if you already own a good-quality appliance, it is more economical to have it repaired than to buy a new one. Although the typical costs of repairing a washing machine are quite high, according to Stiftung Warentest, this is still more economical over the long term than buying a new one. This was confirmed by the Oeko-Institut in 2016: its calculations show that buying a new machine every time a budget model develops a fault is 13 per cent more expensive than buying one durable washing machine.

Figure 4: Total annual costs of washing machines with different lifespans



Source: Oeko-Institut 2016

To sum up: the difference in life cycle costs between washing machines with a short life (5 years), average life (10 years) and a long life (20 years) is relatively small. The high purchase costs of durable washing machines, the somewhat improved energy efficiency of follow-on generations and the expense of any repairs that may become necessary are broadly equivalent to the costs of purchasing several budget appliances.

However, there is one major caveat: the true costs of short-life washing machines are very much higher than stated in the studies mentioned above. As we have already explained, the manufacturing of washing machines is energy- and resource-intensive and has substantial environmental impacts. If washing machines are only kept in service for a short time, more of these appliances have to be produced, with a correspondingly high environmental impact. Appropriate

measures then have to be taken to mitigate or repair the damage to the environment (including action to protect the global climate). The costs of restoring the environment are not reflected in the retail prices but are borne by the whole of society. This is known as externalisation of costs. Ultimately, we all pay a higher price, albeit indirectly, if you choose a non-durable appliance or decide not to have your current model repaired.

Using [Forum Waschen's wash calculator](#), you can check how much more electricity your old washing machine uses and how much it is costing you per year compared to a new and more efficient model.

What are the maximum repair costs that are still economical?

Stiftung Warentest issued the following recommendations in 2017:

- In terms of value for money, the older the machine, the less you should spend on having it repaired.
- In the first five years, repairs should cost no more than 50 per cent of the purchase price.
- After 10 years, repairs should cost no more than 20 per cent of the purchase price, as repairing an appliance after 10 years extends its useful life by just three years on average.

In order to save money on a repair, Stiftung Warentest recommends checking, first of all, whether you can repair the fault yourself. Information on easy fixes can usually be found in the user's guide and on manufacturers' websites. Simple repairs can also be carried out with the help of websites such as www.Kunning-elektro.de and www.waschmaschinendoktor.de. However, please do not dismantle the appliance yourself. More complex repairs, such as fixing electrical faults, should always be carried out by a trained technician.

If the guarantee has expired, consumers should ask for a quote from several independent repairers and compare them with the prices charged by the manufacturer's customer service centre. In many cases, the independent repairers will offer you a better deal.

2.2. Fridges and freezers

For fridges and freezers, the solution to the "repair or replace" dilemma will depend on the old and the new model's age and energy rating.

From an environmental perspective, it is worth **replacing** fridges, fridge-freezer-combis and freezers that are still in good working order under the following circumstances:

- On average if the appliance was purchased before 2000 and is replaced with a new appliance with an energy rating of A++ or higher,
- If the existing appliance has a B energy rating or lower and is replaced with a new product with an A++ energy rating or higher.

Faulty appliances with an A or A+ energy rating can be repaired in order to extend their useful life. However, replacing them with a high-efficiency model (A+++) is the better option.

There are currently no environmental benefits to be gained from replacing appliances with an A++ or A+++ energy rating. These appliances should be **repaired** in order to extend their useful life.

The new, energy-efficient appliance should then be kept in service for as long as possible as no rapid or major efficiency advances are anticipated in the (near) future compared with today's high-efficiency models. Replacing an A+++ -rated appliance with a new model would only offer benefits if, for example, the new model consumed 50-80 per cent less electricity.

Disposal: Always dispose of old appliances correctly, as they contain refrigerants that are harmful to the environment. This applies especially to appliances that are more than 20 years old (manufactured in or before 1997). They may contain halogenated refrigerants and foaming agents which have high or very high global warming potential (GWP) and, in some cases, high ozone depletion potential (ODP).

2.3. Dishwashers

For dishwashers too, the solution to the "repair or replace" dilemma will depend on the old and the new model's age and energy rating. From an environmental perspective, it is worth **replacing** appliances that are still in good working order under the following circumstances:

- The appliance was purchased before 2000 or has an energy rating of A or lower. It should be replaced with an A+++ -rated appliance.

There is little environmental benefit to be gained from purchasing a new, possibly more efficient appliance to replace an efficient dishwasher with an energy rating of A+ or higher, so it may well be worth having the appliance **repaired**.

New and high-efficiency models (A+, A++ and A+++) should be kept in service for as long as possible as no rapid or major efficiency advances are anticipated.

Dishwasher facts and figures

Back in 2008, the Oeko-Institut investigated whether replacing dishwashers that were still in good working order offered any environmental benefits. It found that replacing an average dishwasher purchased before 1997 (energy consumption above 1.57 kWh per wash cycle, D energy rating) with an (at that time) new A-rated appliance (consumption: 1.12 kWh per wash cycle) was environmentally beneficial. However, replacing a dishwasher purchased between 1998 and 2001 (1.2 kWh per wash cycle) with an A-rated appliance narrowly failed to deliver any environmental benefits. There were also few benefits to be gained from replacing appliances purchased between 2001 and 2004 (1.18 kWh per wash cycle) with A-rated machines (Öko-Institut 2008). At that time, the difference between the older models (1998-2004) and the new (efficient) appliances was very slight (just 0.06 to 0.08 kWh per wash cycle).

However, there are now far more efficient dishwashers on the market, so there are probably benefits to be gained from replacing appliances purchased after 1997 as well.

In 2014, the energy consumption of dishwashers then on the market averaged 0.96 kWh per wash cycle – close to an A++ rating (JRC 2017). A+++ -rated appliances use approximately 0.84 kWh per wash cycle, while some premium appliances achieve 0.67 kWh (2017). So the difference compared to the older models built in 1998-2004 and reviewed in 2008 is now far greater (0.34-0.36 kWh per wash cycle for an A+++ -rated appliance; 0.51-0.53 kWh for a premium appliance).

In 2015, the Oeko-Institut looked at the issue again. This time, its calculations focused on whether it was worth replacing a high-end dishwasher manufactured in 2000/2005 (electricity consumption: 1.05 kWh per wash cycle, corresponding to A+) with a new appliance (electricity consumption: 0.84 kWh, equivalent to A+++) (difference: 0.21 kWh per wash cycle). The study revealed that the

payback periods are roughly eight or nine years for primary energy consumption and global warming potential (GWP) and even longer for other indicators. In other words, replacing these appliances does not offer any substantial benefits.

From these findings, the Oeko-Institut drew the conclusions, outlined above, on whether it is worth replacing an appliance that is still in good working order or whether a repair is recommended on environmental grounds.

2.4. Tumble dryers

Should you repair or replace your old tumble dryer? It all depends on its energy rating:

- **Buying a new appliance or replacing an existing appliance that is still in good working order** offers environmental benefits in the case of older models purchased before 2000 or dryers without a heat pump (B energy rating or lower).
- Energy-efficient heat-pump appliances, however, should be **repaired**: replacing them with a new and more efficient model does not offer any significant environmental benefits.

New and efficient appliances – ideally, high-efficiency heat-pump tumble dryers – should be kept in service for as long as possible as no rapid or major efficiency advances are anticipated in the (near) future compared with today's high-efficiency models. If you have purchased an energy-efficient heat-pump tumble dryer within the last few years, keep it in service for as long as possible. If it develops a fault, have it repaired in order to extend its useful life.

It is a different situation if you have a tumble dryer without a heat pump (B energy rating or lower). In this instance, the best environmental option is to replace it with a tumble dryer with an A++ energy rating or higher. The ecological payback time (i.e. the time period until an appliance compensates for the environmental impact of its own manufacture and begins to make a positive contribution to the environment) for two indicators – cumulative energy demand (CED) and global warming potential (GWP) – are 2.3 and 3.4 years, respectively, for frequent use. These periods are much shorter than a tumble dryer's expected lifespan.

Energy ratings for tumble dryers

Energy ratings for tumble dryers were introduced in 1996; the ratings used at that time were A-G. For many years, all the tumble dryers available on the market were rated C or lower. It was not until 2000 onwards that heat-pump tumble dryers were increasingly placed on the market and achieved an A energy rating. As the heat-pump dryers outperformed the A rating criteria by a considerable margin and there was very little difference between them, three new energy ratings were introduced in 2012: A+, A++ and A+++. Most heat-pump dryers are rated A+ to A+++. Tumble dryers without heat pumps (conventional tumble dryers) achieve a B rating at best. This means that since the introduction of the new ratings, very few A-rated tumble dryers have been available on the market (this is known as a technology or efficiency gap). Furthermore, since 2013, appliances rated D or lower have been banned from sale. A similar ban on C-rated condenser dryers was introduced in 2015. In effect, this means that only C-rated vented tumble dryers, B-rated conventional condenser dryers and A+ to A+++-rated heat-pump dryers are currently available on the market.

According to Stiftung Warentest (10/2017), 80 per cent of dryers sold in Germany are now equipped with a heat pump.

2.5. Vacuum cleaners

Should you get your faulty vacuum cleaner repaired, or should you buy a new one – which is better for the environment? It all depends on its energy rating.

- If the faulty appliance has an energy rating of A+++ to B, a **repair** is the more eco-friendly option. You can carry out simple repairs such as changing a filter or replacing a torn hose yourself.
- If the faulty vacuum cleaner is energy-rated C or lower (D), the eco-friendly option is to replace it with a **new appliance** with the highest energy rating (A+++).

Consumers should then keep the new appliance in service for as long as possible so that the high environmental impact of the manufacturing process is balanced out by the energy savings. Back in 2013, the Oeko-Institut showed that the manufacturing process can account for as much as one third of a vacuum cleaner's total environmental impact over its lifetime.

Is a repair more expensive than buying a new appliance?

Vacuum cleaners have an average lifespan of eight years. However, almost 50 per cent of consumers replace their vacuum cleaner within five years. Their stated reasons for doing so are that the appliance has developed a terminal fault or they are not satisfied with its performance.

According to Stiftung Warentest, affordable **repairs** for vacuum cleaners are only economical in the first four years after purchase. If a vacuum cleaner is repaired twice during its eight-year lifespan, the total repair costs will exceed the costs of replacing it with a new appliance as soon as a fault develops. So it is important, when buying a new appliance, to look not only at its energy rating but also at durability.

However, you can turn your hand to some repairs yourself. Most vacuum cleaners are quite simple devices without any complicated electronics and can be repaired by someone with no technical skills. If necessary, seek advice – perhaps visit a Repair Café. It is also very important to follow the manufacturer's cleaning and maintenance instructions – which you can find in the user's guide – in order to keep the appliance in good working order. Floor nozzles, filters, hoses and dust collectors on bagless models are easy to clean, for example. Independent testing institutes such as Stiftung Warentest regularly issue advice on looking after your vacuum cleaner so that it lasts longer.

Vacuum cleaners: regulations on energy efficiency and performance

Since September 2017, only vacuum cleaners with a rated input power of less than 900 watts and maximum sound power level of 80 dB(A) may be placed on the market. Average energy consumption must be less than 43 kWh/year (based on a 87 m² standard dwelling surface and 50 cleaning tasks per year; however, the actual figure will depend on individual usage). Vacuum cleaners must also meet other standards, such as minimum dust pick-up on carpet (dpuc) and minimum dust pick-up on hard floor (dpuhf). Maximum dust re-emission standards also apply. These regulations ensure that despite the reduction in rated input power, the appliances achieve good cleaning performance and do not re-emit dust. To reduce obsolescence, the minimum operational motor lifetime is 500 hours and a minimum durability requirement has been introduced for hoses, which must still be usable after 40,000 oscillations under strain. As of 2017, water filter vacuum cleaners must also comply with these criteria. Each vacuum cleaner placed on the market must be provided with an A+++ to D energy label (instead of an A to G label); this has applied since September 2017. The EU energy label also provides information about annual energy consumption, dust pick-up on carpet and hard floor, dust re-emission and sound power level in dB(A). However, not all types of vacuum cleaner are covered by the EU regulation. The following are exempt:

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- Wet, wet and dry, robot, industrial, central and battery-operated vacuum cleaners
 - Floor polishers
 - Outdoor vacuums.
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Further information

[EcoTopTen – this Oeko-Institut platform offers market reviews and detailed information on top-rated eco-friendly home appliances](#)

[Oeko-Institut background paper: "What are my rights if I want my product to have a longer useful life?"](#)

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The Oeko-Institut is a leading independent European research and consultancy institute working for a sustainable future. Founded in 1977, the institute develops principles and strategies for ways in which the vision of sustainable development can be realised globally, nationally and locally. It has offices in three cities in Germany: Freiburg, Darmstadt and Berlin.

Resources for further reading

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