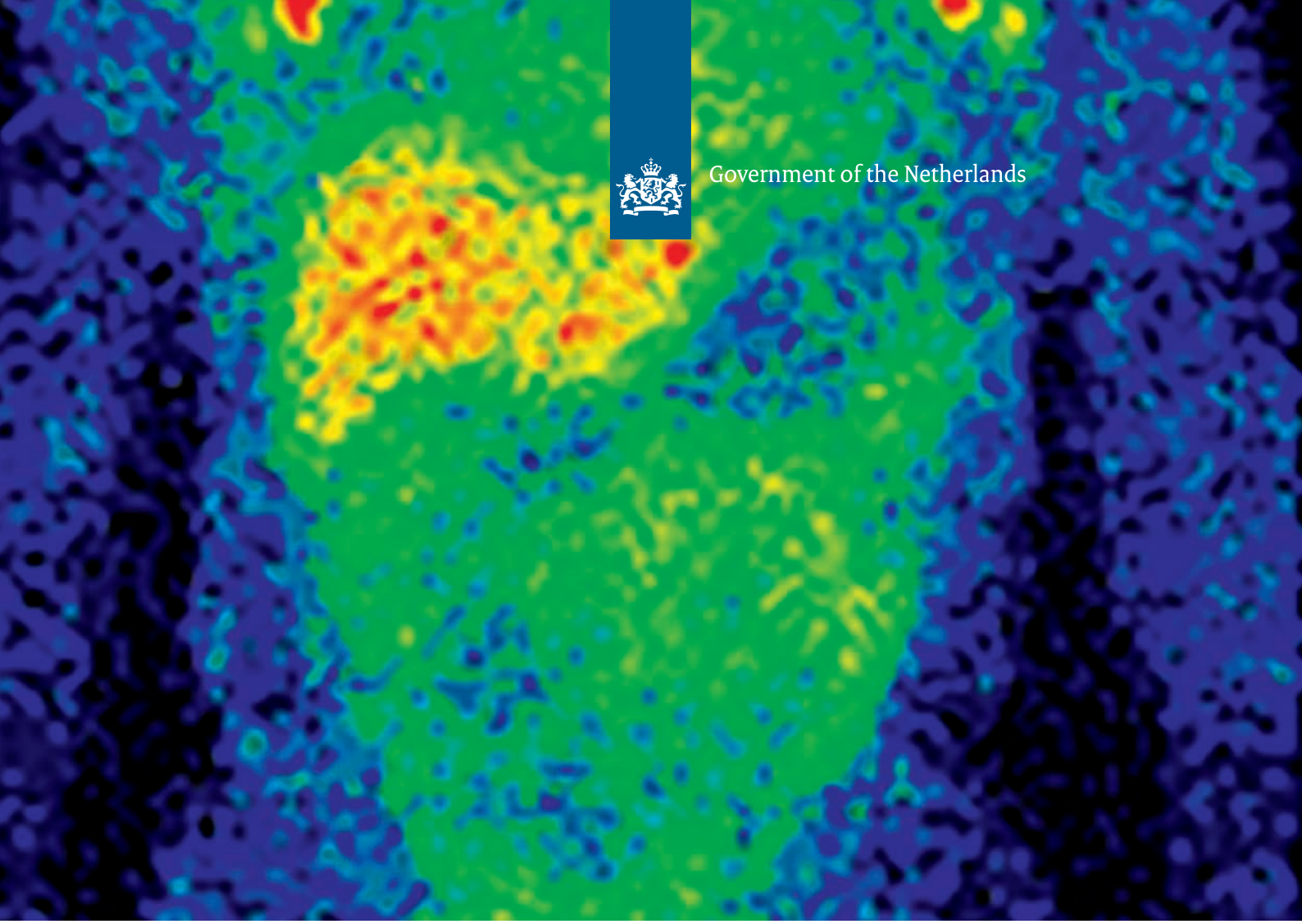


Government of the Netherlands

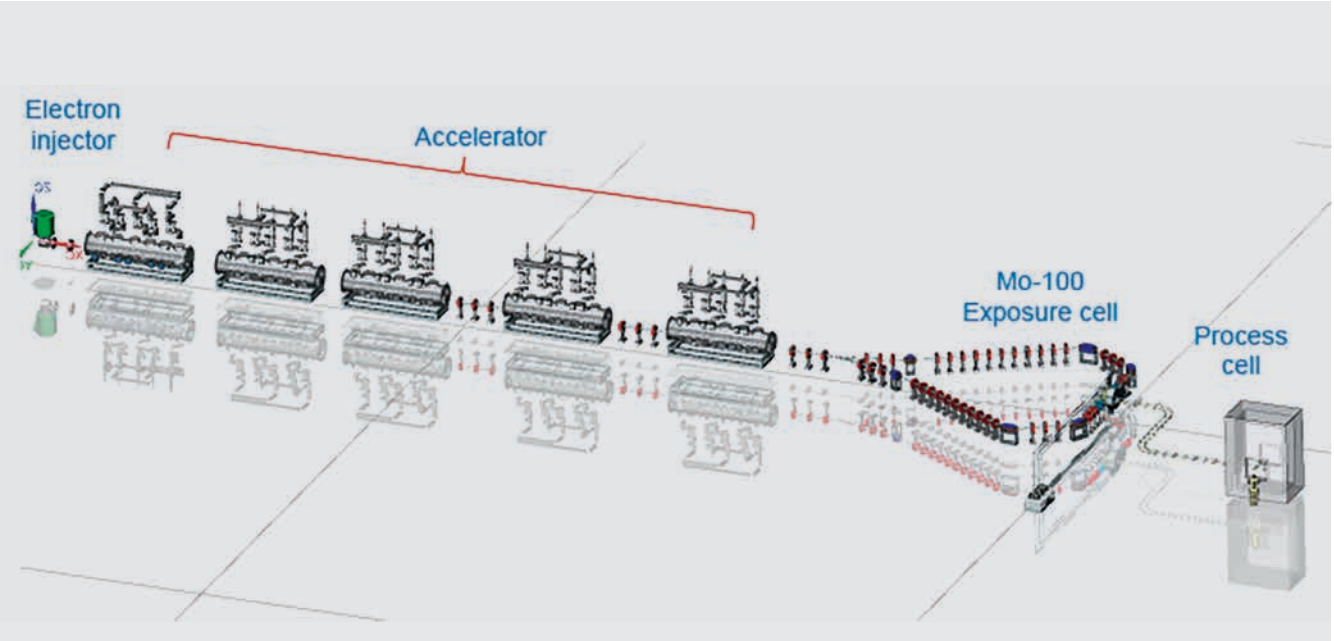
# LightHouse: Cancer diagnostics without nuclear waste

Large-scale production of medical isotopes without the need for a nuclear reactor: that is the goal of ASML's LightHouse initiative. Medical isotopes are used to detect and treat cancer.
We are dependent on a steady supply of these isotopes; yet in reality, there are only a few outdated reactors worldwide that produce medical isotopes. The current production method also yields nuclear waste. ASML happened across this new technique inadvertently while searching for a powerful source of extreme ultraviolet light for the newest generation of chip machines. LightHouse is an interesting alternative because it enables one to produce just as many isotopes with a smaller installation as with a nuclear reactor. What's more, it offers possibilities for creating isotopes beyond the current typical range. ASML's LightHouse is an example of how an innovative company may, by pure chance, make revolutionary discoveries in a completely different field. Thanks to its innovative nature, sustainability and impact on the healthcare industry, LightHouse has been named a National Icon!

## National Icon

Nationaal Icoon

National Icons are remarkable innovations that create jobs and increase turnover and exports for the Netherlands. They also contribute to the resolution of societal challenges. These Icons are selected every two years and receive extensive support from the cabinet. National Icons are appointed indefinitely: once an Icon, always an Icon. Each Icon is assigned a Minister as personal ambassador, who is able to open doors in government and within a broad network. The cabinet can therefore offer assistance in securing funding and new partners, in realising adjustments to legislation or setting agendas at a European level. The Dutch government additionally strives to garner as much attention for the Icon project as possible, using fora such as state visits, trade missions and professional expos/trade fairs.




## Innovation for medical isotopes

Nuclear medicine makes use of radioactive isotopes such as Technetium-99m in order to detect cancer. The isotopes are injected, after which the patient's body is scanned. This allows doctors to detect tumours and more accurately diagnose certain types of cancer. The isotopes lose their radioactivity after a few hours. At the moment, manufacturing medical isotopes requires enriched uranium and yields radioactive waste. If one of the four nuclear reactors worldwide were to stop working, it would have drastic consequences for our ability to detect and treat cancer. LightHouse instead uses an electron beam to produce medical isotopes without nuclear waste, eliminating the need for a nuclear reactor altogether.

## Possibilities

By implementing the LightHouse technique, a small installation can produce just as many isotopes as a nuclear reactor.
Those medical isotopes will also be produced without the use of uranium – and thus without creating nuclear waste. And, because the LightHouse installations are easier to maintain, the supply security of the isotopes will increase as well. What's more, the new method is cheaper: electron accelerators are much more affordable than nuclear reactors and also eliminate the issue (and costs) of nuclear waste.

## Partners

Isotopes for patients are in demand all over the world. Because all the reactors in which they are produced have become outdated, now is the time to consider innovations such as LightHouse.
While LightHouse has the potential to greatly impact healthcare, the technique is not part of ASML's core business. For this reason, ASML is seeking partners to further develop the technique for commercial application and to invest in its future. ASML wishes to support LightHouse while ceding the leadership role.

## Contact

ASML is seeking partners to further develop LightHouse in order to further develop the technique and bring it to market.
Patrick de Jager
Email: patrick.de.jager@asml.com


## Ambassador

The Minister of Public Health, Welfare & Sport supports the development of LightHouse and works to remove hurdles faced by the enterprise wherever possible. These efforts will allow the National Icon to reach its full potential and realise its ambitions in the Netherlands and beyond.