



# Key insights in this Solution Paper

At IBA, we believe in a business model that creates shared and sustainable value for all stakeholders: patients, clients, employees, shareholders, society, and the planet. Our company is a certified B Corp ™, a movement of companies verified to meet the highest standards of social and environmental criteria and using their business as a force for good.



With these values at heart, and while also targeting state-of-the-art clinical objectives, we have designed a scalable ProteusONE system, to meet evolving needs, maximize the potential of future technologies, and reduce the environmental impact of radiation therapy.

Discover the unique features of ProteusONE and how we help you ensure the long-term value of your investment.

In this Solution Paper, you will learn:

- Why ProteusONE, a scalable solution, provides unmatched long-term value
- How ProteusONE and IBA contribute to limiting the environmental impact of radiation therapy



## This Solution Paper is primarily intended for

- Hospital Executives
- Radiation Oncologists
- Medical Physicists
- EHS Managers

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# How to scale smart with ProteusONE and benefit from unmatched long-term value \_\_\_\_\_

Managing a radiotherapy department is complex, and keeping up with fast evolving technology can be challenging. When it comes to proton therapy, it is critical to integrate the latest innovations and advances as they can significantly affect your patient recruitment and treatment quality. It is also important to **consider your future needs, to support your center's growth and evolution over time.** 



At IBA, we provide flexible scalable solutions, and a strong upgradability vision to help you progress on your journey. You can for example start small and scale up with upgrades and expansions to grow your practice and research capability. We can support you in building a business plan and validating your assumptions.

Whichever approach you select, by collaborating with IBA and choosing ProteusONE, you will be supported throughout your equipment lifetime and able to embrace new technologies when you are ready to do so.

Proton therapy is evolving quickly, with new technologies opening up new possibilities and continuously improving clinical practice. At IBA, we are committed to helping you leverage innovations, to stay at the forefront of precision medicine and embrace the full potential of proton therapy.





### Upgrades

IBA has a unique experience in upgrades. We provides an extensive offer of upgrades, which customers can purchase based on their specific needs all along their equipment lifetime. Upgrading your proton therapy center can for example allow you to **treat new indications, deliver faster and sharper treatments, increase your patient throughput and volume, and reduce your operational costs and environmental impact.** Upgrades also contribute to your system's durability and sustainability by extending equipment lifetime.

Our upgrade catalog offers many options, from feature upgrades linked to treatment delivery to imaging and workflow upgrades. Many of these focus on increased efficiency, sharpness of treatment, and on satisfaction of both patients and staff.

IBA is the only proton therapy company with a proven upgrade record, offering a simple and cost-effective way to take the next step. ProteusONE is designed for upgradability to meet evolving needs and extend its usability and lifecycle. Most of our upgrades are seamlessly installed and do not require the interruption of clinical operations, ensuring the continuity of care.

Several of our clients who are early Proteus users have chosen to make incremental improvements and upgraded their systems after several years of operations, to benefit from the latest advances and increase their performance. This for example includes Northwestern Medicine in the United States which adopted Pencil Beam Scanning (PBS) and the Antoine Lacassagne Center in Nice, France, which integrated Cone-Beam Computed Tomography (CBCT).

You will be able to upgrade your ProteusONE system with new technologies in the future.



We have chosen an equipment with proven reliability, the ProteusONE, from the world's leading supplier, IBA, with a long-term engagement and partnership over 20 to 30 years.



#### DR ALEJANDRO MAZAL

**Technical Director and Head of Medical Physics** *Quirónsalud Proton Therapy Center, Madrid, Spain* 



One piece of advice that I can give from all my years in proton therapy is to recognize that when one goes into a relationship with a vendor, this is a very unique relationship. It's one that involves a big capital expense and it's one that's going to on for decades and decades. You have to enter in a relationship with a really stable partner. One who's going to be here, one who's innovating and one who will be with you for the entire length of the machine and then for the restoration that may well follow.



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DR ANTHONY ZIETMAN Chief of Radiation Oncology Massachusetts General Hospital, Boston, United States 15+years of experience in Proteus upgrades30+upgrades introduced in<br/>IBA proton therapy centers2023First entire system restoration signed\*900%of Proteus users believe it is very or extremely important to have upgradable proton<br/>therapy equipment1

### **Updates**

Updates are an improvement to the Proteus system through the installation of new hardware or software, with substantially the same functions and performance with the replacement of an outdated or obsolete component by a newer version during a planned maintenance. Updates are included in our IBA Operations & Maintenance Platinum services contracts (for more details, contact your IBA representative).

\* With Massachusetts General Hospital, Boston, United States





### The next revolutions

ProteusONE is a future-ready platform, designed to be compatible with the next disruptive proton therapy innovations. These solutions include, for example:



**DynamicARC**<sup>®\*</sup>: IBA is developing a new delivery technique called DynamicARC<sup>®</sup> proton therapy. It allows dynamic irradiation while the gantry is rotating, with the advantages of both Pencil Beam Scanning (PBS) and Bragg Peak without the exit dose. It aims to deliver faster, simpler, and potentially sharper proton therapy treatments.



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**Motion Management**<sup>\*\*</sup>: Treating moving targets with confidence has always been a challenge and kept some patients who needed proton therapy away from it. IBA is working towards an integrated motion management solution to treat those patients with more confidence by providing features that enhance the treatment workflow.



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**ConformalFLASH** <sup>©</sup>\*\*\*: FLASH is a key research area that may improve the clinical relevance of proton therapy for patients around the world<sup>2,3</sup>. FLASH aims to deliver treatment at an ultra-high dose rate (> 40 Gy/s) in one to five fractions. IBA is very well positioned to drive the development of FLASH irradiation, the next major innovation expected in radiation therapy. IBA is investing heavily in developing a novel technique using the Bragg peak called ConformalFLASH<sup>®</sup>.



#### CLICK ON THE BUTTON OR SCAN THE QR CODE TO LEARN MORE

These technologies are considered by the scientific community the next revolutions in proton therapy. If you are initiating your proton therapy journey today, it is crucial to consider that you might want to integrate these technologies in the future. This will enable you to continuously bring the best care to your patients, and reach your center's targets. IBA is working to make these technologies available on our Proteus systems. We are currently partnering with our users and industry partners [Elekta, Raysearch, IBA Dosimetry, etc.] to establish proofs of concept and prepare the clinical roll-out.

As such, your investment in ProteusONE today can help you excel in the future, leveraging the latest technologies to continue to enhance patient care.

\*DynamicARC<sup>®</sup> Proton Arc therapy solution currently under research and development phase. It will be available for sale when regulatory clearance is received. \*\*Motion Management is a solution currently under research and development phase. It will be available for sale when regulatory clearance is received. \*\*\*ConformalFLASH® Proton FLASH irradiation solution currently under research and development phase. It will be available for sale when regulatory clearance is received.

## Expandability

#### At IBA, we help you consider your long-term options and build a vision for the future.

ProteusONE can be augmented through smart expansions, whenever your patient demand grows. You can add one or several ProteusONE systems to your center after a first installation, with strong flexibility and versatility to meet your needs.

For example, if your strategy is to expand in the same location with a second room in the future, you have several options at the start: build both bunkers at the same time, build the foundations of the second bunker only or just reserve space and build the second bunker at a later stage. You can of course also choose to expand in a different location.



Having multiple single rooms with one accelerator per treatment room rather than one shared accelerator serving several treatment rooms offers numerous advantages. Firstly, the expansion will not generate any downtime as the rooms are independent, operating as single units. This also means there is full redundancy between rooms meaning any downtime will only impact a single room. In addition, multiple single rooms with the compact ProteusONE offer a reduction in building size and infrastructure cost without compromising on the clinical indications you can treat. The significant cost savings represent several million euros/dollars and operational costs may also be lower. Another significant advantage of multiple single rooms is the continuous beam access: you will never wait for a beam used in another room which leads to faster clinical workflow in each room. It is crucial to consider how you could expand your center from the start. Without an expandability vision at the beginning of your journey, you could find yourself in a tricky situation when the demand grows. This could lead to having to start from scratch and build a whole new center, with avoidable construction and operational costs.

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Scaling smart is really important. We wanted to offer proton therapy but not be committed to a major unit with three or four rooms. We wanted to start with one and then we had the opportunity to expand to a second or third. That absolutely was the right decision for us financially. Also, having multiple single units allows us to have backup to transfer patients, minimizing interruptions.



DR RONALD CHEN

*Chair of Radiation Oncology University of Kansas Medical Center, Kansas City, United States* 

# How to limit the environmental impact of radiation therapy with the support of IBA and ProteusONE \_\_\_\_\_

The healthcare sector accounts for close to 5% of global greenhouse gas emissions<sup>4</sup>. In hospitals, energy consumption is also a major concern, with energy performance of medical equipment under greater scrutiny. In this context, we are a few players exploring solutions to reduce the environmental footprint of healthcare and energy costs, adopting more sustainable practices.

At IBA, we are strongly committed to playing our part. Protecting the environment is core to the way we operate as a company. Compared to current and previous generation proton therapy systems, ProteusONE is more sustainable, with a lower energy consumption per patient<sup>5</sup> and an extended lifetime.

### IBA's sustainability strategy

IBA has a clear and ambitious sustainability strategy based on four pillars:



Low carbon, low waste products



Low carbon, low waste company

We are working to reduce waste and make our organization carbon neutral by 2030.



Diverse, equitable and inclusive workplace

lifecycle and value chain.

We pro-actively incorporate diversity, equity, and inclusion into our business.

We strive to reduce the CO<sub>2</sub> and waste

impact of our products across their

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## Company accountable to sustainability

We are accountable and transparent about our sustainability journey. We build sustainable supply chains, by screening the societal and environmental impact of our suppliers.

### Ecodesign

From project design to equipment performance, every effort is made to reduce ProteusONE's impact on the planet. At IBA, we fully embrace ecodesign.

Through the introduction of the eight ecodesign rules in Research & Development processes, we have been continuously reducing the environmental impact of our installed base. For example, energy efficiency, mass reduction and design for maintainability and upgradability are three of the eight ecodesign rules.

### Reduced environmental impact

**ProteusONE's average electrical consumption offers up to 30% reduction** compared to the single room proton therapy systems from another vendor<sup>5</sup>.

In addition, compared to previous generation multi-room proton therapy systems with a single shared accelerator, ProteusONE has a significantly lower environmental footprint. Its electrical consumption is notably lower, as well as the quantity of concrete required for the infrastructure of two or more treatment rooms.

## ProteusONE environmental footprint compared to previous generation multi-room proton therapy systems with a single shared accelerator

	single room	two rooms	three rooms
Electrical consumption	<b>78%</b>	<b>41%</b> lower	<b>18%</b> Lower
Concrete required for the infrastructure		<b>59%</b> lower	<b>55%</b> lower

IBA also provides predictive proactive maintenance to better anticipate servicing needs, decreasing waste of resources. We minimize the impact of servicing as well by using sea freight for return parts rather than air freight. To further reduce our environmental footprint, we are currently working on reusable packaging.

### Longer product lifetime

IBA's proton therapy systems have a track record of longevity. ProteusONE is designed for maintainability and upgradability increasing its overall lifetime, and consequently reducing its environmental impact per year of use.

Today, it is estimated that the system has a lifecycle of 20+ years based on effective maintenance and upgrades.

Several of our clients have had IBA systems in operation for nearly 25 years. The Massachusetts General Hospital in the United States was the first to install IBA proton therapy equipment and the system continues to be in use to this day.



Even a system installed in 1997 can be upgraded with features developed today. This a testament to the ingenuity and creativity of the engineers and physicists that work together to make this possible.



**DR JAY FLANZ** Former PTCOG President and Technical Director Massachusetts General Hospital, Boston, United States

### Decommissioning

IBA makes every effort to reduce the quantity of activated materials to be managed during decommissioning. This is why "reduce activation" is one of the eight IBA ecodesign rules. Clients can decide to use the low activation concrete that IBA has developed together with its partners which means the mass of building materials that is considered radioactive waste is significantly reduced. This also contributes to lower decommissioning costs.



## Essential takeaways

- Consider your needs today and tomorrow, ensuring you can upgrade and expand your center in the future
- Assess the environmental impact of the solutions you choose to reduce your electrical consumption and the quantity of concrete used for the infrastructure in order to protect the planet

We hope this overview helps you consider scalability and sustainability as you plan your proton therapy journey.

At IBA, we are committed to helping you remain at the forefront of precision medicine for years to come, working with you to maximize your investment.





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## References —

- 1. IBA. (2023) ProteusONE user survey
- 2. Diffenderfer E et al, The Current State of Pre-Clinical Proton FLASH Radiation and Future Directions. Medical Physics, 2021. [PubMed]
- 3. Bourhis J et al, Clinical translation of FLASH radiotherapy, Why and how?. Radiotherapy and Oncology, 2019. [Pub-Med]
- 4. Watts N et all, The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. Lancet. 2021 Jan 9;397(10269):129-170. doi: 10.1016/S0140-6736(20)32290-X. Epub 2020 Dec 2. Erratum in: Lancet. 2020 Dec 14: PMID: 33278353. [PubMed]
- 5. IBA. (2023) Sustainability Comparisons. Unpublished internal company document.



## Available resources

This Solution Paper is part of a series highlighting the unique benefits of proton therapy with ProteusONE for cancer centers:



### Patient & Staff Experience



#### **Expertise & Versatility**



#### Peace of Mind



#### Why Beam Quality Matters



#### Scalability & Sustainability



Proton Therapy Center Development - Synthetic Guide





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Scalability & Sustainability  $\cdot$  Solution Paper

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