SUMMARY OF KEY AIMS FOR R&D INTO PARTICLE ACCELERATORS FOR APPLICATIONS

Advances in the development and applications of Particle Accelerators have involved a significant R&D effort over the last 50 years, and have hugely benefited society, in order to continue the progress made, it is essential to encourage R&D across awide range of disciplines that are associated with Accelerator Physics, more specifically:

›› COMPACT ACCELERATORS
More-compact accelerator technology is a key factor in all applications in this sense, the development, in the medium term, of superconducting components is crucial. In the longer term, laser and terahertz acceleration techniques could potentially offer a dramatic reduction in size, although significant development is still needed to establish if this reduction can be achieved in a suitable environment.

›› IMPROVED DESIGNS AND COST-EFFECTIVENESS
Simpler and lower-cost designs and concepts, with higher efficiency, reliability, robustness, and reduced costs of operation are needed in many accelerator applications, more specifically in health, industry and security; even the ready mobility of accelerator equipment is a growing need for some applications.

›› IMPROVED ACADEMIA–INDUSTRY INTERACTIONS
The development of accelerators for 'big science' drives the majority of advances in accelerator R&D worldwide. Manufacturers of accelerators for industrial and other uses are often not well connected to these efforts. Programmes are required to better connect commercial accelerator groups, research facilities, universities and health centres.

›› IMPROVED STUDENT TRAINING AND KNOWLEDGE-TRANSFER
The basic education and training of students in relevant fields are essential to increase the flow of a suitably trained workforce into industries manufacturing and applying accelerator technology; good knowledge-transfer into industry is also essential.

›› IMPROVED PUBLIC UNDERSTANDING OF ACCELERATORS AND THEIR SCIENCE
Investment in the better public understanding of the science and applications of accelerators is needed, as well as better-informed perceptions of any risks.

›› IMPROVED R&D COLLABORATION WITHIN THE EU
A stronger coordination of R&D efforts and collaborations at the EU level would be highly beneficial.

›› FURTHER DEVELOPMENT OF COMBINED IRRADIATION AND IMAGING
The merging of irradiation techniques and online-imaging is a major step, especially in the health and security sectors, where rapid and accurate detection (and treatment in the case of health) are desirable.