century and it is expected to continue during the next few years of the twenty-first century. Then, the growth will probably continue at a slower pace unless new technological advances are developed and commercialized. In that case, growth could accelerate.

Photovoltaics is poised to become a large global high-tech industry, manufacturing and selling modules in nearly every country. Governments and entrepreneurs should be aware of this. Public R&D support has always been generous. It must continue to be so for those countries that want to maintain leadership in this technology. Partial subsidization of PV installations is permitting an unprecedented development of the PV industry and will also help the industry of the countries involved in this endeavor to take the lead.

Crystalline Si technology, both monocrystalline and multicrystalline is today clearly dominant, with about 90% of the market. It will remain dominant at least for the next ten years. The trend is towards the multicrystalline option. Si is one of the most abundant elements in the Earth's crust but the purified Si used in today's solar cells is obtained primarily as off-grade poly-Si and scrap wafers from the microelectronic industry. Soon it will not be enough for the growing PV industry. Thus, some concerns exist regarding a shortage of the purified silicon for the PV industry. However, it is doubtful that Si technology will be able to reach competition with conventional electricity. Consequently, low-cost alternatives and high-efficiency novel concepts, many already in development, are needed.

Thin-film technology is one of the candidates to take over from Si technology in the long-term. There are many technological options regarding thin-film materials and methods of deposition but their primary claim to the throne currently occupied by Si is that they can be ultimately produced at much lower cost.

Concentration of sunlight is another candidate for mass penetration of photovoltaics, although it will not be easily accepted for the grid-connected houses, one of the most promising applications today. Concentrators will probably find incipient niche markets in big stand-alone applications or as small, central-power plants during the present decade.

Finally, new materials and device designs based on III-V semiconductor alloys, such as GaInP allowing more efficient use of the solar spectrum are now being developed for space applications. With the use of concentrators, they may be of interest for terrestrial applications, with the potential of reaching competitive costs with conventional electricity. Other options, such as quantum dots and dye-sensitized solar cells, are still in the initial research phase. They must compete not only with the ubiquitous Si but also with the other options, mentioned above for funding for further development.

Thus, photovoltaics possesses a panoply of novel technologies that almost ensures that alternatives will be available when the current Si wafer technology cannot reach prices low enough to compete with conventional electricity. If this happens, a strong industry and infrastructure – first developed for the Si technology – will be able to seamlessly take this new PV technology and apply it worldwide. In any case, the present "subsidies" to research or application must be considered as public investment in a policy with strong public support and long-term human benefits.

The widespread contribution of PV electricity in electric grids will require a new type of grid management that can accept small generators as well as small consumers. On