and cheaper, however, the solar cells produced from them feature lower efficiency than the cells produced of its monocrystalline form due to structural defects present. It is justified, therefore, to seek new cells manufacturing technologies from polycrystalline silicon ensuring higher efficiency at relatively low costs. The outcome of such quests is the (C) technology of polycrystalline silicon laser texturisation with chemical etching (C) described in this study. This highly attractive technology with a large potential has been valued most highly in the group of three polycrystalline silicon texturisation technologies subjected to a comparative analysis in this chapter. Better optical properties for silicon and better electrical properties for the cells prepared from them have been attained as compared to the (A) technology: polycrystalline silicon alkaline texturisation. The (B) technology: although the polycrystalline silicon laser texturisation without chemical etching allows to obtain the lowest (most beneficial) effective reflection coefficient, nonetheless, the efficiency of the so produced solar cells is sharply falling. Taking into account the strategic development of the (C) technology, a stormy environment where it is situated is the biggest issue. The environment offers multiple opportunities coming from a very attractive, prospective area of future industrial applications as well as multiple inconveniences connected with intense global competition and broad alternative quests for effective solar production technologies such as: etching in acidic solutions, reactive ion etching, mechanical texturisation and with a use of a diamond edge. The results of foresight-materials science research presented in this chapter are part of a broader project [39] aimed at selecting the priority innovative technologies of materials surface engineering and setting the directions of strategic development, as discussed in a series of publications, in particular [40-44].

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