

CHAPTER V

CONCLUSION AND RECOMMENDATION

Conclusion

The study meets the set objectives both in terms of technical aspect and economical aspect and can be concluded as follows:

1. Technical Aspect

1.1 Measured value of sheet resistance of in-house TCO glass is 14.07 Ohm/square. This value satisfies the specification required for sheet resistance for TCO glass of 12-15 Ohm/square used as the superstrate of a-Si PV modules.

1.2 The average value of the uniformity of ITO layer of in-house TCO glass is 6.26%. This value lies within +/-10 percent acceptable ranges.

1.3 Measured light transmission of in-house TCO glass is 83% between 400-700 nm regions. The light transmission value obtained is higher than 80 percent limit over the optical window 400-700 nm for a-Si PV module's requirement.

2. Economical Aspect

From cost calculation, the cost of in-house TCO glass is approx. THB 360 per piece compared to commercial TCO glass which costs THB 600 per piece. This means cost reduction of THB 240 per piece or equivalent to 40 percent cost reduction. As TCO glass takes 54 percent of the total direct material cost of the a-Si PV module, it can be concluded that in-house TCO glass can reduce the production cost of each a-Si PV module by 20 percent.

The above results confirm that in-house TCO glass with ITO layer has the properties of TCO glass required for producing commercial a-Si PV module and can contribute to the cost reduction of the TCO glass itself and a-Si PV module as the whole.

Recommendation

This study focuses on cost reduction for a-Si PV module with in-house production of TCO glass having ITO as the transparent and conductive layer. This In-house TCO glass proved to be both economically and technically feasible. But indium is rare and expensive metal. Cheaper ZnO can be a good candidate to ITO as it renders compatible technical requirement on TCO glass but may be at lower cost to produce. The same TCO coating line can easily be modified using ZnO targets instead of ITO targets.