As the cost of greenhouse gas (GhG) emissions continues to rise, and a growing number of countries are accelerating their reviews of their own energy strategy in light of the Fukushima nuclear disaster, the ambitious targets set by many countries to reduce GhG emissions are in danger of not being met. The combination of these factors together with the move away from nuclear power, is adding further fuel to the rapid growth of cleantech and renewable energy.

Solar technology is playing a role in an increasing number of larger-scale projects that have been initiated by, for example, funds, private equity companies and the power and utilities industry. In response to heightened public concern following Fukushima, governments that are looking to decarbonise their economies are encouraging investments in solar technologies in a number of ways (such as tax incentives), thereby supporting growth in the industry. As a result, today, the solar industry is a growth industry around the world, with Asian producers gaining market share at the expense of other areas, mainly Europe. Yet markets remain volatile in the wake of the financial crisis and research and development (R&D) spending is still high, driving the developers of different photovoltaic technologies to lower cost points and raise efficiencies. In the foreseeable future, photovoltaic electricity will become cheaper than grid electricity in a growing number of markets, in turn, creating further demand.

While these factors create growth opportunities, they also increase economic uncertainty and risk. The industry has large capital requirements, as well as financing constraints, and it needs to regulate capacity in both supply and production. It must also confront the disparate organisational challenges arising from high growth, regional market shifts and the aftermath of the financial and economic crisis.

The first wave of solar power customers is attempting to mitigate the operational risks they face by using long-term arrangements and outsourcing on a reliable price/cost basis. To that end, sales contracts range from simple terms-of-sale to complex long-term financing and operating agreements. In between, there is some interaction between the participants in the value chain, which adds further complexity to the business.

All of this leads to a bundle of IFRS accounting issues, for which only some answers are readily available. For other issues, the solution is less clear and, as a result, there is some diversity in practice. This guide aims to address the specific challenges of IFRS accounting in the solar technology industry.

The guide is intended to help you identify and address the relevant accounting issues. It provides insights on common IFRS issues that are relevant to your business and provides you with the related accounting guidance. Furthermore, we aim to draw your attention to potentially unforeseen accounting consequences that should be carefully considered when planning transactions.

We present several issues in this second edition and discuss our views on the related IFRS solutions in a Q&A format. The fact patterns are based on a fictional company, “Sunshine”, which produces solar cells. Sunshine has a strong business relationship with “Module plc”, which produces solar panels.

The sample fact patterns in this guide address some of the commonly occurring IFRS issues that may be relevant to your business today and in the near future. Please note that these sample fact patterns may not fully address the specific issues you face. Each business will need to exercise judgement to determine the appropriate accounting solution. The IFRS solutions presented are based on IFRS effective as of 31 December 2011. We invite you to discuss further issues with us and welcome any thoughts that you may have on the guide.

The International Accounting Standards Board (IASB) currently has a number of projects underway, as well as standards that were issued in 2011, but are not yet effective, that will result in significant changes to some accounting standards and, therefore, some of the areas addressed in this publication (e.g., revenue recognition, leases, consolidation and financial instruments). The outcome of these projects is likely to affect the guidance presented herein, and the status of those projects should be considered before making any final decisions.

Olaf Boelsems
Ernst & Young EMEIA Cleantech IFRS Leader
3. Embedded derivatives ................................................................. 27
  3.1 Foreign currency contracts – embedded derivatives ...........................................27
  3.2 Long-term foreign currency prepayments ...........................................................29
  3.3 Contingent (acquisition) cost for property, plant and equipment ............................30

4. Research and development ................................................................. 33
  4.1 Continuous development on existing products ......................................................34
  4.2 Process and other improvements to property, plant and equipment ..........................35

5. Property, plant and equipment, inventories and impairment ................................. 39
  5.1 Determining useful life for new technology .........................................................39
  5.2 Impairment – delay in setting up a new facility ....................................................40
  5.3 Impairment – factoring in expected increase in margin and output ..........................41
  5.4 Inventory measurement in ramp-up phase ..........................................................42
  5.5 Inventory measurement – decline in supply prices and in product sales prices ..........43
  5.6 Industrial gas supply contract – embedded leases .................................................43
The solar industry is young and experiencing rapid growth; demand and supply are not yet well balanced. New technology is driving both opportunity and risk. As a result, sales arrangements often reflect the parties' desire to secure supplies and deliveries for the long term, in an effort to mitigate risk and to link them to financing.

To minimise operating risks in their individual projects, purchasers of solar panels and related equipment generally seek long-term warranties from their suppliers. As such, suppliers of solar equipment will face several IFRS issues related to the initial sale and the long-term warranty arrangements, including:

- When to recognise revenue
- How to measure revenue
- Whether to set up a provision for a warranty obligation
- How to measure a warranty obligation

**Revenue.** IAS 18 *Revenue* sets out five criteria that must be satisfied in order to recognise revenue from the sale of goods:

1. The entity has transferred the significant risks and rewards of ownership of the goods to the buyer
2. The entity retains neither continuing managerial involvement to the degree usually associated with ownership, nor effective control over the goods sold
3. The amount of revenue can be measured reliably
4. It is probable that the economic benefits associated with the transaction will flow to the entity
5. The costs incurred or to be incurred in respect of the transaction can be measured reliably

IAS 18 views the passing of risks and rewards as the most crucial of the five criteria. IAS 16 *Property, Plant and Equipment* also provides examples of when an entity may retain the significant risks and rewards of ownership. The example that is most relevant to the solar industry is the situation where the entity retains an obligation for unsatisfactory performance that is not covered by normal warranty provisions.

It is necessary to establish the point in the earnings process at which both the significant risks and rewards of ownership are transferred from the seller to the buyer and any significant uncertainties (that would otherwise delay recognition) are removed. In the sale of goods under a standard warranty clause, the significant risks and rewards of ownership are generally transferred when the goods are delivered to the customer. However, in situations where the supplier provides warranty extensions and other non-standard warranty terms, an assessment is required to determine whether the warranty terms represent a separate revenue-generating element in a multiple element contract. The assessment is based on the individual terms and conditions of the contract, which will require judgement.

When the selling price includes an amount for subsequent servicing which is assessed as a separate element, that amount is deferred and recognised as revenue over the period during which that service is performed. The warranty extension that is provided for an extra fee may give rise to a separate revenue stream (a service). Revenue is then recognised "by reference to the stage of completion of the transaction at the end of the reporting period" — i.e., using the percentage-of-completion method. In applying the percentage-of-completion method, the requirements of IAS 11 *Construction Contracts* are "generally applicable to the recognition of revenue and the associated expenses for a transaction involving the rendering of services" (paragraph 21 of IAS 18). However, a practical expedient is available in IAS 18 paragraph 25: when services are performed by an indeterminate number of acts over a specified period of time, revenue should be recognised on a straight-line
basis over the specified period unless there is evidence that some other method better represents the stage of completion.

IAS 18 requires revenue to be measured “at the fair value of the consideration received or receivable”. The accounting guidance in IAS 18 is, however, unclear as to whether long-term advances require interest income to be accrued. We believe that organisations may choose — as a consistently applied accounting policy — one of the two approaches described below:

1. As the advance is long-term in nature, an entity may consider accruing interest on the advances until the respective revenue is recognised. The fair value of consideration received before revenue can be recognised is higher than the fair value of the cash received either upon delivery or after delivery. Therefore, in the case of our fictional solar cell producer, Sunshine, interest may be accrued until the service is delivered using Sunshine’s incremental borrowing rate at the time the advance payments are received. Accruing interest would be accounted for as a charge to interest expense and an increase to the advance received. Revenue is then measured as the service is rendered based on the allocation of the nominal amounts of the advance payments corresponding to the stage of completion, plus the amount of interest accrued thereon.

2. Alternatively, as a consistently applied policy choice, an entity may choose not to accrue interest on advance receipts for the purpose of revenue recognition. IAS 18 may be interpreted to only allow interest to be imputed on deferred payments, hence, disallowing the accrual of interest on advance receipts. Alternatively, IAS 18 may be interpreted to require that interest must be imputed on deferred payments, but as it remains silent on advance receipts, it neither requires nor prohibits accrual of interest on these. Revenue recognition would be based on the allocation of the nominal amounts of the advance receipts corresponding to the services delivered. It is expected that the new standard on revenue will clarify the accounting treatment required for advance receipts.

Provisions. IAS 37 Provisions, Contingent Liabilities and Contingent Assets defines provisions as liabilities of uncertain timing or amount. A provision shall be recognised when:

(a) An entity has a present obligation (legal or constructive) as a result of a past event

(b) It is probable that an outflow of resources embodying economic benefits will be required to settle the obligation

And

(c) A reliable estimate can be made of the amount of the obligation

If these conditions are not met, no provision will be recognised. Warranty provisions are specifically addressed in Example 1 of the Guidance on implementing IAS 37 Provisions, Contingent Liabilities and Contingent Assets. The example deals with a manufacturer that gives warranties to purchasers at the time of sale of its products and, based on past experience, has determined it is probable (i.e., more likely than not) that there will be some claims under the warranties. The example concludes that a provision is recognised for the best estimate of the costs of making good under the warranty products sold before the end of the reporting period.

The standard makes it clear that where there are a number of similar obligations, the probability that an economic outflow will occur is based on the class of obligations as a whole. Hence, the probability of an economic outflow occurring for warranties as a whole will need to be evaluated. This is more likely to give rise to a provision, because the probability criterion is considered in terms of whether at least one item in the population will give rise to a payment. Recognition then becomes a matter of reliable measurement and entities calculate an expected amount of the estimated warranty costs.
The extended warranty commitment is also considered at the time of delivery of the good. The cost recognition, and therefore, any provision to be recognised, depends on how the stage of completion is determined for recognising revenue. For example, if revenue is recognised on the basis of the time of the contract, the costs must also be recognised on a time basis — such that, to the extent there have been no outlays, a provision may need to be built up over the period of extended warranty.

Entities also need to evaluate whether a contract is onerous and recognise a provision for an onerous contract, under the requirements of IAS 37. This may be particularly relevant to contracts that either cover significantly long periods of time or exist in high-interest rate economies. In such cases, the advance may have been calculated based on discounting future revenue streams.

In the following section, we discuss examples of the application of this guidance to common transactions in the solar industry.

### 1.1 Long-term warranty arrangements

#### 1.1.1 Standard warranty term plus separately priced prepaid warranty extension

**Fact pattern**
Sunshine sells solar panels to retail customers under a two-year warranty term, which is in line with minimum legal requirements. In addition, a five-year extension to the warranty is offered. The extension is sold at an additional fee that reflects the fair value of this extension. Both the product and the additional warranty fee are paid at delivery. Based on past experience, Sunrise is able to reliably measure the costs to complete the additional service warranty.

**Issues**
- When does Sunshine recognise revenue and to what extent?
- Is a provision required to be recognised and, if so, how is this provision measured?

**Resolution**

**Revenue.** Sunshine would recognise the revenue associated with the sale of the solar panels when the significant risks and rewards of ownership are transferred to the customer (i.e., most likely when the solar panels are received by the customer).

As Sunshine is able to reliably measure both the revenue associated with the extended warranty and the costs to complete the additional service warranty, the revenue for the separately priced warranty period would be accounted for by reference to the stage of completion. There are numerous ways that the stage of completion can be determined, and judgement is required to determine which method is appropriate for the arrangement made.

The solar technology company, SMA Solar Technology AG, describes revenue recognition from warranty extensions as a significant estimate, as follows:

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**Excerpt from 2010 Annual Report of SMA Solar Technology AG, p.174**

... payments received for nongratuitous warranties are [recorded] over the warranty period as sales revenues on a straight-line basis since, in this case, a linear progression of warranty costs is also adopted as the best possible estimation method.
Provision. The sale of its solar cells obliges Sunshine to fulfil its two-year standard warranty obligation. As it is more likely than not that there will be an outflow of resources for some claims under the standard warranty as a whole, a provision is recognised, at the time of the sale of the solar panels, for the best estimate of the costs of making good under the warranty.

The costs associated with the extended warranty are dependent on how the stage of completion is determined for recognising revenue. If revenue is recognised on the basis of the time of the contract, the costs must also be recognised on a time basis.

1.1.2 Standard long-term warranty agreement – reliable measurement of cost

Fact pattern
In line with its standard warranty provisions for large customers, Sunshine provides a 20-year standard warranty period on the sale of solar cells. Since Sunshine has only been selling these solar cells for five years, the internal historical records only provide a five-year track record for warranty claims. In addition, external information on the repair experience in the industry (for comparable products) is available for only the last 15 years. Neither the internal nor the external industry data justify extrapolation of the costs for a 20-year warranty period.

Issues

› Assuming the first four criteria for recognising revenue from the sale of goods are met, does Sunshine have sufficient information to reliably measure the costs to be incurred in order to recognise revenue at the time the solar cells are delivered? (Assume the contract represents the sale of a single element.)

› How should Sunshine measure the warranty provision?

Resolution

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>When to recognise revenue</th>
<th>How to measure the warranty provision</th>
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<tr>
<td>Scenario 1. The materials used have been available for 20 years and the processes to implement the materials have been used in other industries in a broadly comparable manner for a period of more than 20 years. From the available data, Sunshine can develop an acceptably narrow range of outcomes regarding how the warranty cost may be incurred (extent and time).</td>
<td>As further data for the materials and the processes applied become available, and as these data provide a basis for a sufficiently narrow range of possible cost outcomes under the warranty obligation, we believe that revenue can be recognised at the time the solar cells are delivered, provided that all other revenue recognition criteria are met.</td>
<td>It will be critical to determine not only the number of claims and the best estimate of the expenditure related to those claims, but also the timing of expected claims. This is crucial to determining the present value of the obligation as the effect of the time value of money will usually be material considering the term of the warranty agreement. The discount rate (or rates) to be applied should be a pre-tax rate (or rates) that reflect current market assessments of the time value of money and the risks specific to the liability. The discount rate(s) will not reflect risks for which future cash flow estimates have been adjusted.</td>
</tr>
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### Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
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<th>How to measure the warranty provision</th>
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<tr>
<td><strong>Scenario 2.</strong> Sunshine is able to simulate usage and age of its products in an accelerated manner. Statistically valid tests support a useful life of more than 20 years and indicate the rate of faults giving rise to a potential warranty claim and related costs.</td>
<td>The statistically valid accelerated tests allow an outlook on the number, timing and type of claims. Therefore, they support a sufficiently reliable determination of the cost to be recognised. Under these circumstances, revenue recognition is acceptable, provided all other criteria for recognition are met.</td>
<td>Same as Scenario 1 above.</td>
</tr>
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| Scenario 3. As Sunshine expects the efficiency of its products to decrease over time, the benchmark value for claims is based on project averages. Under a specified project, no claim would arise if some items perform worse than the benchmark value, but others that perform better could compensate for the underperformance. This benchmark declines in line with the age of the solar cells. | In this scenario, there are still no data beyond the first 15 years of industry experience. Accordingly, there is a gap between the warranty period of 20 years and the historical data available. This may raise doubt on whether revenue can be recognised over the warranty period. However, the declining benchmark agreed for the solar cells may provide a narrowing of potential cost outcomes that would support a sufficiently reliable measurement of cost. We believe that this approach is judgemental, and it may be difficult to overcome the reliable measurement hurdle. | In the event that revenue recognition is acceptable, the determination of the provision will generally follow the same route as in Scenarios 1 and 2. For the first 15 years, there is likely no difference. However, for the longer term, the degree of detail may vary, depending on whether and how the expenditure is expected to develop as a result of the falling benchmark agreed on and the discounting effect, which is higher in the longer term. |

As shown in the table above, revenue would be recognised as soon as the measurement of cost is sufficiently reliable. Until revenue can be recognised, any prepayment received is deferred, and cost incurred for the inventory would still be recognised in Sunshine's financial statements. Furthermore, no provision is set up until revenue is recognised (unless the contract is onerous) and Sunshine will need to consider if disclosures on critical judgements or estimates under IAS 1 Presentation of Financial Statements need to be made.

With regard to measuring the provision, the first two scenarios provide a data basis that covers the whole warranty period of 20 years. In measuring the best estimate of the expenditure required to settle the present obligation at the end of each reporting period, risks and uncertainties will be taken into account. As stated previously, entities calculate an expected value of the estimated warranty costs. IAS 37 refers to the "expected value" method and illustrates how it is calculated in an example of a warranty provision (Example 1 of IAS 37 IE).
Q-Cells provides guarantees for its products as a manufacturer and seller of photovoltaic cells and is thus subject to warranty risks. The Q-Cells Group guarantees that delivered cells achieve at least 90% of nominal performance for 10 years. Further, Q-Cells guarantees performance of at least 80% of the contractually agreed minimum performance for solar modules for a maximum period of 25 years from the date shipped from the factory, and of at least 90% for a period of 10 years from the date shipped from the factory. There were no significant claims in financial year 2010.

The guarantee provisions for production cover long-term guarantees usual in the industry on cells and modules (10 to maximal 25 years). The non-current portion of the provision in the amount of €12.5 million (previous year: €11.0 million) was discounted using an interest rate of 0.56% to 3.59% corresponding to the remaining term (previous year: 3.5%); the current portion is €4.4 million (previous year: €4.3 million). Since Q-Cells Group and its competitors have only been producing solar cells and solar modules for a comparatively short period, the calculation of guarantee provisions is inherently uncertain. The guarantee provision estimates are based mainly on the product warranty expenses established by Q-Cells from historic data available within the Group. Changes to these assumptions could impact upon the Company’s results in the future. Q-Cells believes that the guarantee provisions as reported represent the best estimate on the reporting date based on past experience.

SolarWorld specifically addresses long-term performance guarantees, and the related provisioning, as a substantial estimate:

The warranty provision is set up for specific individual risks, for the general risk of claims due to statutory warranties and performance guarantees with regard to sold solar modules. The latter are granted for a period of 25 years. Since SolarWorld AG has been producing and selling solar modules for significantly less than 25 years, it is hardly possible to fall back on experience regarding the calculation of the performance guarantee provision. Much rather, assumptions and estimations are required that are subject to uncertainties. Their modification due to gaining experience regarding claims due to the performance guarantee over the course of time can lead to adjustments of the provision of consequences on the expenses from warranties recognised on the income statement.

The provision for warranties is set up for specific individual risks, for the general risk of being called upon in accordance to statutory regulations and performance guarantees granted with regard to photovoltaic modules sold. The provision for the risk of being called upon for performance guarantees is set up in an amount of 0.25 percent of all SolarWorld Group’s module revenue. This lump sum rate represents the current estimation of the discounted total expenses over the entire term of the performance guarantee (the performance guarantee is granted for a period of 25 years). It is subject to compounding at matched maturity interest rate. In the business year, this makes for interest expenses of €454k (2009: €306k), which are recognised in other financial expenses in note 35c (p.195).
1.1.3 Common long-term warranty agreement — reliable measurement of cost to be incurred

Fact pattern
In line with its standard warranty provisions for large customers, Sunshine has agreed to a 10-year warranty period on the sale of solar cells. Since Sunshine has only been selling solar cells for five years, the internal historical records can only provide a five-year track record for warranty claims revealing an annual average warranty expense of 0.05% of the sales prices. In addition, external information on the experience of the industry (for comparable products) is available for the past eight years. It indicates an average annual warranty expense of 0.07% of the sales. Solar research institutes are not able to predict whether the expenses incurred in the first five to eight years are representative for the remaining warranty period. However, from the kind of materials used and the processes applied to them, a technical life of more than 10 years is derived, and the warranty expense is regarded as determinable with sufficient reliability.

Issues
- Can revenue be recognised at the time of delivery of the solar cells?
- Does a provision for a warranty obligation need to be recognised and, if so, how is it measured?

Resolution
Revenue. Revenue is recognised when the risks and rewards pass to the customer as there is no continuing managerial involvement to the extent usually involved with ownership, and the costs to be incurred can be determined reliably (we assume that all other criteria for revenue recognition are met as the fact pattern does not indicate otherwise). Hence, Sunshine would record revenue at the time of delivery.

Provision. To measure the provision that is required to cover the warranty obligation, Sunshine needs to combine the available data in order to come up with its best estimate of the present value of the expense for the whole warranty period of 10 years. In doing so, Sunshine will need to assess whether the internal data provides a better basis for extrapolating warranty costs than the industry data. Furthermore, Sunshine must consider the more general information for the expected longer-term warranty expense. This means that Sunshine needs to adequately consider the similarities and differences in circumstances and adjust the general data to the specific facts and circumstances surrounding its solar cells. This will require judgement.
1.2 Repurchase arrangements

As in many industries, entities in the solar technology industry sometimes sell goods and subsequently purchase items produced from these goods. IFRS may prohibit revenue recognition in these cases. In a sale and repurchase agreement for an asset other than a financial asset, the terms of the agreement need to be analysed to ascertain whether, in substance, the seller has transferred the risks and rewards of ownership to the buyer and hence whether revenue is recognised. When the seller has retained the risks and rewards of ownership (determined through indicators, including primary responsibility for providing the goods and services; inventory risk; discretion in establishing prices; and customer’s credit risk), even though legal title has been transferred, the transaction is a financing arrangement and does not give rise to revenue.

The fact patterns below provide insights on some commonly observed issues and the related accounting.

1.2.1 Delivery with restricted use and repurchase arrangement for follow-on product

Fact pattern
Sunshine delivers solar cells to Module plc. Under a separate contractual arrangement, Module plc is obligated to produce solar panels from Sunshine’s solar cells and to deliver these solar panels to Sunshine. Sunshine then sells these solar panels on to other customers. Module plc does not source solar cells from anywhere else and does not deliver solar panels to any other client. The price for the solar panels contains the cost of the solar cells without a margin and adds a price for the assembly work and components added by Module plc. Both the supply and purchase contracts do not allow offsetting of receivables or payables.

Issues
- Should Sunshine recognise revenue from the sale of solar cells to Module plc?
- Should Module plc recognise revenue from the sale of solar panels to Sunshine?

Resolution
Sunshine does not get back the solar cells it delivered to Module plc, but rather a product that contains the solar cells that it has produced. This purchase by Sunshine is made at the same price for the cells as was invoiced in the transfer to Module plc. In substance, Module plc is performing a service for Sunshine rather than a sale and purchase transaction. Given the overall picture, including the sole sourcing from and to Sunshine, it is clear that revenue may not be recognised by Sunshine as the risks and rewards of the solar cells were not transferred to Module plc. The series of transactions is in essence a service arrangement between Sunshine and Module.

In addition, Module plc does not recognise gross revenue from the sale of the solar panels to Sunshine. Rather, Module plc excludes from revenue the portion related to the solar cells received and returned to Sunshine.

SolarWorld AG points to supply and delivery arrangements in its substantial judgements:

**Excerpt from 2010 Annual Report of SolarWorld, p.159**

SolarWorld Group concluded supply and purchase agreements that are – from an economic point of view – to be considered toll manufacturing and were therefore accounted for accordingly.
1.2.2 Delivery with part of the quantity under restricted use and repurchase arrangement for follow-on product

Fact pattern
Similar to the previous example, Sunshine delivers solar cells to Module plc. Under a separate contractual arrangement, Module plc is obliged to produce a fixed quantity of solar panels from Sunshine's solar cells and to deliver these solar panels to Sunshine. However, in this example, excess solar cells delivered to Module plc may be sold by Module plc to other parties. The price of the solar panels to be delivered to Sunshine contains the cost of the solar cells without a margin and adds a price for the assembly work and components added by Module plc. The price to Sunshine may be different from the price to other customers of Module plc. Both the supply and purchase contracts do not allow offsetting of receivables and payables.

Issue
- Should Sunshine recognise revenue from the sale of solar cells to Module plc?

Resolution
Sunshine does not get back its solar cells, but rather a product containing its solar cells. This purchase by Sunshine is made at the same price for which the cells were invoiced in the transfer to Module plc. The price to Sunshine may differ from that charged to other customers of Module plc, but this does not affect Sunshine's accounting. In substance, Module plc is performing a service for Sunshine rather than a sale and purchase transaction for those items. Similar to the conclusion in the previous example, revenue may not be recognised by Sunshine for the solar cells delivered to Module plc under the repurchase agreement.

1.2.3 Delivery with unrestricted use and purchase agreement without specification of components to be included

Fact pattern
Sunshine delivers solar cells to Module plc. Module plc is not contractually restricted as to their use and may use these solar cells to produce and sell solar panels to Sunshine and other third parties. Sunshine regularly orders solar panels made by Module plc, but it does not specify which solar cells must be included in the solar panels. Sunshine only requires that the solar panels show at least the same efficiency factor as if they were made from Sunshine's solar cells. Module plc has other sources that it can use for procurement of the respective solar cells. Both the supply and purchase contracts do not govern offsetting of receivables and payables.
Issue

• Should Sunshine recognise revenue from the sale of solar cells to Module plc?

Resolution

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<td><strong>Scenario 1.</strong> Solar cells from Module plc's other suppliers are more expensive. The price for the solar panels to be delivered to Sunshine contains the cost of the solar cells invoiced by Sunshine without a margin and adds a price for the further work and components added by Module plc.</td>
<td>Sunshine does not receive solar panels which include, in all cases, the solar cells it delivered to Module plc. However, because the price charged to Sunshine is based on the price of the solar cells that were transfer to Module plc, Sunshine would not recognise revenue on the initial transfer of the solar cells to Module plc.</td>
</tr>
<tr>
<td><strong>Scenario 2.</strong> Solar cells from other suppliers of Module plc are at the same cost as Sunshine's solar cells. However, they are more difficult to implement and hence, the production is more costly compared with the cost of using Sunshine's solar cells. The price for the solar panels to be delivered to Sunshine includes the cost of the solar cells invoiced by Sunshine without a margin and adds a price for the further work and components added by Module plc, which is based on the expected costs required for implementing Sunshine's solar cells.</td>
<td>Same as Scenario 1. The fact that the price charged by Module plc to Sunshine is based on the expected costs required for implementing Sunshine's solar cells, would, in our view, prohibit Sunshine from recognising revenue on the initial transfer of solar panels to Module plc.</td>
</tr>
<tr>
<td><strong>Scenario 3.</strong> Solar cells at the same efficiency grade can be procured by Module plc at both lower and higher costs, with a trade-off in production costs. Overall, the total of the solar cells and related production costs is at the same level. The price for the solar panels to be delivered to Sunshine is agreed without reference to Sunshine's solar cells and contains an arm's-length margin for the whole module. Module plc makes use of this opportunity as better solar cells are available for its production and observably uses different solar cells for the solar panels delivered to Sunshine over time.</td>
<td>Sunshine would recognise revenue at the time the solar cells are sold to Module plc because the pricing for the solar panels containing Sunshine's solar cells is at arm's length (assuming the other criteria for revenue recognition are met).</td>
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1.3 Long-term prepayment received from customer

Fact pattern

Sunshine agreed to a 10-year contract for the delivery of solar cell production with a customer. As part of the contract, a non-refundable prepayment is agreed up front. Such prepayments will be offset against future deliveries (each at market prices at the time of delivery) for a period of up to 10 years. Sunshine received the prepayments with no interest specified in the agreement.

Issues

• How should the prepayment received be presented in the balance sheet?
• How should the prepayment be measured?
Not all projects for building a solar power plant qualify for construction contract accounting under IAS 11.

Resolution

Prepayments received are presented as liabilities. A prepayment made for a longer period – in the fact pattern, for up to 10 years – would be split into a current portion and a non-current portion following the current/non-current distinction under IAS 1 Presentation of Financial Statements. Such a split may need to be based on an estimate of how much of the prepayment's carrying value will probably turn into revenue during the current term, with the remaining portion being allocated to non-current liabilities.

Q-Cells SE, for example, presents prepayments received in both non-current and current liabilities (2010 annual report, pp. 163, 165).

Measurement. In our view, an entity may choose a consistent accounting policy that either accrues interest or does not accrue interest on the prepayments received. Further discussion of the financing impact of long-term prepayments is included in section 2.1, Long-term payments to suppliers section, below.

SolarWorld AG reports on long-term prepayments and advances received in the following:

Excerpt from 2010 Annual Report of SolarWorld, p.159

Customer advances and prepayments particularly include those in connection with long-term sale contracts regarding silicon wafers and long-term purchase agreements regarding elemental silicon. According to the agreements concluded, these advances and prepayments are non-interest-bearing. Due to the fact that from an economic standpoint these agreements contain a financing component, an implicit or matched maturity interest rate is compounded.

1.4 Sale of self-developed solar plant project – percentage of completion

A construction contract is defined as being specifically negotiated for the construction of an asset or a combination of assets that are closely interrelated or interdependent in terms of their design, technology and function or their ultimate purpose or use. The meaning of “specifically negotiated for the construction of an asset” has been considered by the IFRS Interpretations Committee. In July 2008, IFRIC 15 Agreements for the Construction of Real Estate was issued. Although IFRIC 15 was written in the specific context of its title, it includes an analysis of the distinguishing features of construction contracts and it is, therefore, more generally relevant in determining whether any contract that involves the construction of an asset is within the scope of IAS 11 or is a sale of goods.

Paragraphs 11 and 12 of IFRIC 15 provide the following guidance in the particular context of real estate:

- An agreement for the construction of real estate meets the definition of a construction contract when the buyer is able to specify the major structural elements of the design of the real estate before construction begins and/or specify major structural changes once construction is in progress (whether or not it exercises that ability). When IAS 11 applies, the construction contract also includes any contracts or components for the rendering of services that are directly related to the construction of the real estate.

- An agreement for the construction of real estate in which buyers have only limited ability to influence the design of the real estate, for example, to select a design from a range of options specified by the entity, or to specify only minor variations to the basic design, is an agreement for the sale of goods and therefore, within the scope of IAS 18.
The guidance under IFRIC 15 can be applied by analogy to other arrangements (i.e., those that do not include real estate). A feature not mentioned in IFRIC 15, but which is commonly the case where the agreement is for the sale of goods, is that the item being sold is homogeneous. As a result, it can either be substituted or freely used for another if the original purchaser does not complete the sale.

Not all projects for building a solar power plant qualify for construction contract accounting under IAS 11. The following is an example of the application of this guidance:

Fact pattern
Module plc develops and builds solar plants on leased land with a view to selling them as early as possible. For this fact pattern, assume that Module plc started a solar plant project on its own, which is specifically for the construction of a combination of assets that are closely interrelated in terms of their design, technology and function. However, no customer contract was agreed to at that time. Module plc found a customer to purchase the solar plant when it had substantially finished the development, design and preparation for the physical construction. The contract provides for limited room to change the design within a range of readily available alternatives. Essentially, the contract suggests the sale of a completed power plant.

Issue
- Is percentage of completion accounting applicable to this contract?

Resolution
Since Module plc agreed on a contract that gives the customer a limited range of standard choices, it is, in our view, appropriate to account for this contract according to IAS 18 and not to apply the percentage of completion method for a sale of goods. A different accounting outcome might have been appropriate if Module plc had not substantially finished development and design at the time of concluding the contract and/or given the customer more flexibility in specifying major elements of the solar plant.

1.5 Percentage of completion – prefabricated modules

When the stage of completion is determined by reference to the contract costs incurred to date, only those contract costs that reflect work performed are included in costs incurred to date. Examples of contract costs that are excluded are set out in IAS 11.31, as follows:

- Contract costs that relate to future activity under the contract, such as costs of materials that have been delivered to a contract site or set aside for use in a contract but not yet installed, used or applied during contract performance, unless the materials have been made specifically for the contract
- Payments made to subcontractors in advance of work performed under the subcontract

An example of the application of this guidance follows:

Fact pattern
Module plc enters into a contract for the specific construction of a solar plant that is in scope of IAS 11 and accounts for the contract under the percentage of completion method. To determine the stage of completion, Module plc compares the proportion of costs incurred for work performed to the estimated total contract costs. As of the reporting date, Module plc has a significant amount of prefabricated inventory that is not yet installed.
Issue

Does the percentage of completion include the costs of prefabricated inventory?

Resolution

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Use percentage of completion accounting?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1.</strong> The prefabricated inventory can be used for multiple contracts. It is, however, set aside for use in the contract.</td>
<td>The inventory in question is not made specifically for the contract since it can be used for multiple contracts. Although the inventory is set aside for use in the contract, this does not suffice to qualify for percentage of completion accounting.</td>
</tr>
<tr>
<td><strong>Scenario 2.</strong> The prefabricated inventory is specially produced for the contract and cannot be used for other purposes.</td>
<td>The inventory is specially made for the contract. Accordingly, the prefabricated inventory is taken into account in determining the percentage of completion.</td>
</tr>
</tbody>
</table>
2. Supply arrangements

Silicon is one of the critical resources in the production of solar cells. Given limited resources of silicon and other raw materials from time to time, specific arrangements have been made in the industry. Thorough consideration and analysis of the terms and conditions of these special arrangements will be required. Some of the complex areas of these arrangements include long-term prepayments, foreign currency contracts and own-use requirements.

2.1 Long-term prepayments to suppliers

Fact pattern
Sunshine agreed to a 10-year contract with its local supplier for the purchase of raw materials to be used in solar cell production. As part of the contract, a long-term prepayment is agreed. This prepayment is not refundable.

Issues
- How are the prepayments presented?
- How are the prepayments measured?

Resolution
Presentation. Prepayments are commonly presented as part of inventories (if related to future inventories). A prepayment made for a longer period would be split into current portion and non-current portions of inventory if the current/non-current distinction under IAS 1 Presentation of Financial Statements is used. Such a split may need to be based on an estimate of how much of the prepayment's carrying value will probably turn into inventories during the current term, with the remaining portion being allocated to non-current. If the current/non-current distinction is not used, paragraph 61 of IAS 1 requires disclosure of the amount expected to be recovered after more than twelve months.

For example, Q-Cells SE presents advance payments made both within current and non-current assets and explains this in its note on inventories and other assets (2010 annual report, p. 153).

Measurement. The most important question on long-term items that are non-interest bearing relates to discounting or accruing interest. Sunshine already made the prepayment and will probably receive goods in the future. If this were a non-interest bearing loan (a financial instrument), it would need to be recognised at fair value and hence a day-one loss may arise in certain circumstances with interest accrued through earnings in the future. However, Sunshine will not receive cash or another financial asset in return but, instead, it will receive goods. Therefore, the prepayment is not accounted for as a financial instrument. Following are examples of the application of this guidance.

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>How are the prepayments measured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: The prepayments will be offset against future supplies (each at market prices at the time of delivery) for a period of up to 10 years. Sunshine makes prepayments at zero interest.</td>
<td>Sunshine needs to pay the market price of the supplies at the time of delivery as purchase prices do not take into consideration the effect of financing. As a result, inventories are accounted for at cost, which is the market price at that time.</td>
</tr>
</tbody>
</table>
Supply arrangements

### Scenarios

<table>
<thead>
<tr>
<th>Scenario 2: The prepayments will be offset against future supplies at a market price less computed interest — the market interest rate that reflects the parties’ estimate of the consumption of the prepayment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agreement provides for a financing element in the prepayment. The parties consider this in setting the prices and the upfront financing reduces the goods’ price. We believe that, where the financing element is explicitly agreed upon, it is appropriate to consider it in the cost of raw material purchased. Interest is accrued over time, therefore increasing the amount recognised as a prepayment (with related interest income accounted for in profit or loss). On delivery, the raw material is recorded at market price (with the counter entry being against prepayments).</td>
</tr>
</tbody>
</table>

During its January 2012 meeting, the IFRS Interpretations Committee discussed the accounting for prepayments in connection with long-term supply contracts. Following is a summary of the Interpretations Committee’s discussion on the topic as reflected in the *January 2012 IFRIC Update* newsletter:

The Interpretations Committee received a request seeking clarification on the accounting for long-term supply contracts of raw materials when the purchaser of the raw materials agrees to make prepayments to the supplier for the raw materials. The question is whether the purchaser/supplier should accrete interest on long-term prepayments by recognising interest income/expense, resulting in an increase of the cost of inventories/revenue. The Committee observed that there is mixed practice on the issue submitted, and that current IFRSs do not provide clear guidance on this issue.

However, the Committee noted that the exposure draft *Revenue from Contracts with Customers* published in November 2011 states that:

- in determining the transaction price, an entity should adjust the promised amount of consideration to reflect the time value of money if the contract has a financing component that is significant to the contract; and that

- the objective is to recognise revenue at an amount that reflects what the cash selling price would have been if the customer had paid cash for the promised goods or services at the point that they are transferred to the customer.

Provided that the requirements on the time value of money are not changed in the final standard on revenue, this would apply in the seller’s financial statements when prepayments are made. The Committee observed that considerations regarding accounting for the time value of money in the seller’s financial statements are similar to those in the purchaser’s financial statements.

The Committee decided to ask the Board whether it agrees with the Committee’s observation, and, if so, whether there should be amendments made in the IFRS literature in order to align the purchaser’s accounting with the seller’s accounting. Provided that the Board agrees that the purchaser and the seller should address the time value of money in such contracts similarly and that the Committee should deal with this matter, the Committee would direct the staff to further analyse which standards should be amended if guidance were to be provided. The Committee would also direct the staff to prepare additional illustrative examples on the impact of accretion of interest on long term prepayments, both in the purchaser’s financial statements and in the seller’s financial statements, in situations that are more complex than those that were presented at the January meeting.

The outcome of the IFRS Interpretations Committee’s deliberations could affect the measurement in Scenario 1 above.
2.2 Long-term prepayment and supplier difficulties

Fact pattern
Sunshine made a prepayment to its supplier for raw materials to be offset during the next 10 years against purchases at the then-market price. After two years, it becomes clear that the supplier will not be able to fulfil the supply obligation for the remaining term. The contract gives Sunshine the right to request repayment of the unused balance. Sunshine makes use of this right and the unused balance becomes due from the supplier.

Issues
- How is the unused prepayment presented after Sunshine exercises it right of refund?
- How is the unused prepayment measured after Sunshine exercises it right of refund?

Resolution
Presentation. The unused prepayment comes due from the supplier at the time Sunshine makes use of its right to request it. Thus, it turns into a right to receive cash (a financial instrument with a short-term nature). Accordingly, the unused prepayment is presented as a receivable from that time and is presented within current assets, unless the repayment terms rule differently.

Measurement. Sunshine will most probably account for the receivable under the amortised cost basis as the receivable meets the definition of the “loans and receivables” category. Sunshine determines the fair value of the receivable using the effective interest rate method, which factors in the estimated future cash flows and the timing of these. Any difference between the carrying amount of the prepayment and the fair value of the receivable at the time it becomes a financial instrument is taken to profit or loss. If estimated cash flows change in either timing or extent, an adjustment to the carrying amount of the receivable would be accounted for.

2.3 Contracts to purchase commodities

Some contracts for materials can easily be net settled in cash or another financial instrument “as if the contracts were financial instruments”, especially when the respective material is traded in an active market (e.g., a stock exchange) or otherwise readily convertible to cash. If this is the case, the accounting for financial instruments may be relevant. IAS 39 Financial Instruments: Recognition and Measurement includes:

- Contracts to sell or purchase non-financial items that can be settled net as if they were financial instruments, except for those entered into and continued to be held for the purpose of the receipt or delivery of a non-financial item in accordance with the entity’s expected purchase, sale or usage requirements (so-called “own-use exemption”)

The requirements on differentiating between own-use contracts and other contracts within the scope of IAS 39 (derivatives to be accounted for at fair value) are not easy to apply. For example, if there are contracts for the same commodity that is both traded and held for own-use, unintended accounting consequences could occur if this issue is not adequately addressed. This is especially true when:

- There is no documented distinction between contracts in the same commodity held for own-use and contracts held for trading
- Despite an existing distinction between those contracts for a commodity held for own-use (own-use book) and those held for trading (trading book), there are either sales to the market from the own-use contracts or there are transfers to or from the trading book. The figure on the next page provides a flow chart on the decisions to be made in connection with determining the accounting for commodity contracts.
The following examples cover fact patterns observable in the solar technology industry. They are based on the assumption that silicon is actively traded, which may not be the case in every instance. The examples only cover a few situations. In practice, many more scenarios may be relevant.

### 2.3.1 Selling or net settling of commodity contracts

#### Fact pattern
Sunshine allocated some short, medium and long-term contracts on silicon, an actively traded commodity, to its own-use book. Management did not intend to resell any of the material to the market or to net settle the contract with the supplier(s). Due to new technology and an increasing number of competitors, Sunshine changed its plans and no longer expected to use all the material under the contracts. Therefore, some of the contracts originally allocated to the own-use book were sold to the market, while others were net settled. Other contracts, especially with short and medium terms, are not sold to the market or otherwise settled net.

#### Issue
- Would the sale or net settlement of some commodity contracts allocated to own-use trigger IAS 39 accounting for the remaining contracts?

#### Resolution
As Sunshine trades some of its own-use contracts in the market and settles other own-use contracts net, it will have a practice of settling similar contracts net in cash or by exchanging financial instruments. This taints the remaining own-use contracts which then need to be accounted for as derivatives within the scope of IAS 39.

Alternatively, if Sunshine had not tainted its own-use portfolio, the own-use contracts would continue to be treated as executory contracts. Unless these are onerous, they would not be recorded until one of the parties to
the contract performed. However, in the event that these executory contracts contain one or more embedded derivatives not closely related to the host contract, these would need to be accounted for separately.

2.3.2 Penalty fees for commodity contracts

Fact pattern
It is common for commodity contracts to have penalty clauses relating to non-delivery or incomplete delivery (by the seller) and non-acceptance of all or part of the delivery (by the buyer) of minimum contracted quantities. The following scenarios arise:

Issue
• Commodity contracts are within the scope of IAS 39 if they can be settled net in cash. Is a non-performance penalty clause in a fixed-price commodity supply contract considered to provide the entity with the ability to settle net in cash?

Resolution

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Are the criteria for net settlement met?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1. Fixed penalty</strong></td>
<td>A fixed price penalty does not consider changes in market value and is not economically beneficial to the defaulting party. Accordingly, a fixed penalty does not meet the criteria for net settled in cash as per paragraph 6 (a) of IAS 39, and therefore, will not cause the contract to be within the scope of IAS 39.</td>
</tr>
<tr>
<td>The buyer (seller) will pay a fixed penalty to the seller (buyer) if it accepts (delivers) less than the minimum contracted quantity. An alternative to Scenario 1 would be where either of the parties pays for the quantities not delivered or not accepted at the fixed contracted price.</td>
<td></td>
</tr>
<tr>
<td><strong>Scenario 2. Asymmetrical default clause</strong></td>
<td>For the asymmetrical variable penalty, the defaulting party has an obligation to compensate the counterparty for the loss it incurs due to unfavourable market price movements as a consequence of the default. It does not give the defaulting party the right to demand any gain its counterparty realises as a consequence of the default. The amount of the penalty represents the loss incurred. Accordingly, an asymmetrical variable penalty does not meet the criteria for net settled in cash as per paragraph 6 (a) of IAS 39, and therefore will not cause the contract to be within the scope of IAS 39.</td>
</tr>
<tr>
<td>The buyer will pay a penalty for the minimum quantities it fails to take delivery of, being the difference between the fixed contract price and the market price if the market price is lower than the contract price. The seller will pay a penalty for the minimum quantities it fails to deliver, at the difference between the fixed contract price and the market price if the market price is higher than the contract price.</td>
<td></td>
</tr>
<tr>
<td><strong>Scenario 3. Symmetrical default clause</strong></td>
<td>For the symmetrical variable penalty, the defaulting party has both an obligation to compensate the counterparty for the loss the counterparty suffers as a consequence of the default and a right to receive any gain the counterparty realises as a consequence of its own default. Symmetrical default clauses require the defaulting party to pay a penalty to the counterparty in the event of default. Such clauses are considered net-settlement clauses. In this case, the seller may be acting as the buyer’s agent. Accordingly, a symmetrical variable penalty does meet the criteria of net settled in cash as per paragraph 6(a) of IAS 39. However, the contract may still be outside the scope of IAS 39 on the basis of the own-use exemption. The contract will only be within the scope of IAS 39 if the entity has a practice of net cash settlement (paragraph 6(b) – i.e., the symmetrical default clause is exercised on non-delivery).</td>
</tr>
<tr>
<td>The buyer will pay a penalty for the minimum quantities it fails to take delivery of, being the difference between the fixed contract price and the market price, if the market price is lower than the fixed contract price. However, if the market price is higher than the fixed contract price, the seller must pay the difference to the buyer.</td>
<td></td>
</tr>
</tbody>
</table>
None of the non-performance penalty clauses described above are considered to be written options because: (1) the penalty is to compensate one of the parties to the contract for losses incurred; and (2) no premium was paid (received) by either party to the contract. Accordingly, paragraph 7 of IAS 39 is not applicable.

2.3.3 Supplier inability to deliver – repayment of amount prepaid

**Fact pattern**
Sunshine is a purchaser in a 10-year contract for the receipt of actively traded silicon, which it intends to use in its production of solar cells. Forty per cent of the agreed quantity is prepaid on the basis of the market prices at the inception of the contract. Two years after the contract became effective, the supplier is no longer able to deliver the silicon in the quality required. Sunshine has the right and makes use of it to demand repayment of the unused part of a prepayment made at the beginning of the contract term. At the reporting date, the repayment has not yet been received. Furthermore, Sunshine needs to purchase a respective quantity from the market in the short term to cover its production needs.

**Issue**
Does repayment of the remaining prepayment constitute a net settlement in accordance with IAS 39?

**Resolution**
The repayment of the prepayment does not trigger a net settlement. It is not even a penalty (see 3.4.2). Nor does the purchase from the market to cover the short position from the supplier's inability to deliver constitute a net settlement. The outstanding repayment is a financial instrument within the scope of IAS 39. It will commonly be accounted for as "loans and receivables" at amortised cost.

2.4 Long-term supply contract – measuring onerous contracts in a restructuring scenario

A contract is onerous if the unavoidable costs of meeting the obligations exceed the economic benefits expected to be received under it. The unavoidable costs under a contract reflect the least net cost of exiting from the contract, which is the lower of the cost of fulfilling it and any compensation or penalties arising from failure to fulfil it. The economic benefits expected to be received include the estimated sales inflows and all related costs for further production and sales.

Future events that may affect the amount required to settle an obligation will be reflected in the amount of a provision where there is sufficient objective evidence that they will occur. It is unlikely that the provision will simply be the net present value of the future losses, because if a substantial duration of the supply contract remains, the entity will probably be able to either agree to a negotiated sum to terminate the contract early, or to adjust prices and/or quantities. Hence, the entity will have to make a best estimate of its future cash flows taking all these factors into account.

**Fact pattern**
Several years ago, Module plc and Sunshine agreed on a 15-year supply contract for the supply of solar cells (not a commodity) by Sunshine at fixed quantities and prices. Since then, the market conditions have changed and the prices for solar cells have declined dramatically. Under current and expected future conditions, Module plc expects
to incur losses from its sales of modules to its customers based on the prices and quantities agreed. Module plc therefore wants to renegotiate the supply contract.

**Issue**

- How does Module plc measure its provision for the onerous contract?

**Resolution**

Since Module plc expects to incur losses from sales to its customers based on the existing conditions, a provision is required to be recognised.

However, the negotiations may impact the measurement of the provision. The provision is measured at the best estimate, which is the present value of expenditures expected to be required to settle the obligation. It will depend on facts and circumstances whether there is sufficient objective evidence to reflect unbinding indications in the measurement of the provision. Following are scenarios which reflect different stages of negotiations of a settlement.

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>How does Module plc measure the onerous contract?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1.</strong> As of the reporting date, negotiations have started and Sunshine indicated that it was generally willing to change conditions favourably for Module plc. No new conditions are set at this time.</td>
<td>We believe that Sunshine's indication is not sufficient objective evidence to change measurement favourably for Module plc. Instead, the general assumptions in determining the best estimate should remain – including assumption on possible cancellation, penalty payments and the like.</td>
</tr>
<tr>
<td><strong>Scenario 2.</strong> The parties signed a letter of intent (non-binding) that includes new prices, quantities and a penalty payment to be paid by Module plc.</td>
<td>Although it may not be legally binding, the assessment of whether the letter represents sufficient evidence that the changes will occur depends on the legal environment and the degree of commitment given the surrounding facts and circumstances.</td>
</tr>
<tr>
<td><strong>Scenario 3.</strong> Sunshine and Module plc finalised negotiations. The contract is not yet signed by Sunshine and Module plc.</td>
<td>The results of the negotiations would usually be reflected in the measurement of the provision unless there is substantial doubt that the contract may finally be signed. If signing is just a formality, it would not hinder reflecting the new terms and conditions in the measurement.</td>
</tr>
</tbody>
</table>

Q-Cells SE reflects such a gradually adjusted approach to measurement in the following:

**Excerpt from 2010 Annual Report of Q-Cells SE, p.163**

The provision for onerous contracts of €25.7 million (previous year: €54.6 million) in 2011 primarily includes expected losses expected in 2011 on possible compensation payments totaling €15.0 million (previous year: €40.0 million). A partial release of provisions made for this risk with an associated credit to income was made in the current year, since the negotiating position with the affected supplier is considered to have improved significantly such that the criteria for establishing the provision no longer apply. A provision of €8.5 million has been established for onerous module purchase agreements (expected utilization of the provision in 2012).
3. Embedded derivatives

Many contracts have features such as price escalation clauses, foreign currency arrangements or other components that are sensitive to separate accounting under the principles for embedded derivatives in IAS 39. An embedded derivative is a component of a hybrid (combined) instrument that also includes a non-derivative host contract – with the effect that some of the cash flows of the combined instrument vary in a way similar to a standalone derivative. An embedded derivative causes some or all of the cash flows that otherwise would be required by the contract to be modified according to some variable, provided that, in the case of a non-financial variable, it is not specific to a party to the contract. Examples of such variables could include a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index. A derivative that is attached to a financial instrument or another contract, but is contractually transferable independently of that instrument or has a different counterparty from that instrument, is not an embedded derivative, but a separate financial instrument.

An embedded derivative will be separated from the host contract and accounted for as a derivative under IAS 39 if, and only if:

- The economic characteristics and risks of the embedded derivative are not closely related to the economic characteristics and risks of the host contract (see IAS 39 Appendix A, paragraphs AG30 and AG33)
- A separate instrument with the same terms as the embedded derivative would meet the definition of a derivative

And

- The hybrid (combined) instrument is not measured at fair value with changes in fair value recognised in profit or loss (i.e., a derivative that is embedded in a financial asset or financial liability at fair value through profit or loss is not separated)

If an embedded derivative is separated, the host contract will be accounted for under IAS 39 if it is a financial instrument, and in accordance with other appropriate standards, if it is not a financial instrument. IAS 39 does not address whether an embedded derivative will be presented separately on the face of financial statements.

3.1 Foreign currency contracts – embedded derivatives

Fact pattern
Sunshine entered into contracts to purchase raw materials with its suppliers. Payments are now due in foreign currency which may or may not be the functional currency of Sunshine or its suppliers.

Issue
Does the foreign currency component in the contract represent an embedded derivative that needs to be accounted for separately?

Resolution
Whether the foreign currency component needs to be separately accounted for depends on the specific facts and circumstances. If the embedded foreign currency derivative is not leveraged, does not contain an option feature and requires payments denominated in the functional currency of any substantial party to the contracts, then no separation is required. The following scenarios provide further clarification of this point.

Scenario 1. Sunshine’s functional currency is the euro and the supplier’s functional currency is the US dollar. To agree on Japanese yen for the payments would trigger separate accounting of the yen component as an embedded
derivative in Sunshine's financial statements. However, if the contract was denominated in either euros or US dollars, the foreign currency element would be closely related, not separated, since it is the functional currency of one of the substantial parties to the contract.

Other circumstances whereby no separation is required include:

- If the agreement requires payments denominated in the currency in which the price of the related good is routinely denominated in commercial transactions around the world (such as US dollars for crude oil transactions), no separation of the embedded foreign currency component is required. For most of the raw materials used in the solar technology industry, we understand that there is no routinely denominated currency for transactions around the world.

- If the embedded foreign currency derivative requires payments denominated in a currency that is commonly used in contracts to purchase or sell non-financial items (like raw materials) in the economic environment in which the transaction takes place (e.g., a relatively stable and liquid currency that is commonly used in local business transactions or external trade), then no separate accounting for the foreign currency component is required.

**Scenario 2.** Assume that silicon purchased in Russia is commonly sold to non-local customers in US dollars. Consequently, the US dollar component is regarded as closely related to the host supply contract and does not need to be separated.

In the event that the foreign currency component is separated, it is accounted for separately as a derivative at fair value. The host contract for the supply of raw material is then accounted for as an executory contract and, accordingly, off balance sheet until one of the parties to the contract performs, unless the contract (excluding the embedded foreign currency derivative) is onerous. The embedded derivative is accounted for as any other free-standing derivative at fair value, with changes in fair value accounted for in profit or loss (unless designated in a hedge relationship, which is not discussed here).

Q-Cells SE reports on embedded foreign currency derivatives that are separated from the host contract as follows:

**Excerpt from 2010 Annual Report of Q-Cells SE, note 6.9, p.154**

**Embedded derivatives**

- Q-Cells identified embedded derivatives within the scope of its sales and purchase and sales contracts in USD.
- For accounting purposes, such financial instruments are considered to be embedded derivatives requiring separation that are included in purchase or sales contracts denominated in USD and for which USD is not the usual currency for settling orders of this kind in international business practice and is also not the functional currency of the transaction partners.
- This balance sheet item contains the positive market value of these embedded derivatives totaling €0.3 million (previous year: €2.0 million).
- The net result from embedded derivatives amounts to €-1.3 million overall (previous year: €-2.3 million). The figure is reported in income from financial instruments.
3.2 Long-term foreign currency prepayments

Fact pattern
Sunshine entered into long-term contracts to purchase raw materials (not commodities) in US dollars from a Russian supplier. No prepayment, or a prepayment of less than the minimum purchase value, is made. Sunshine’s functional currency is euros and the Russian supplier’s functional currency is rubles.

Alternative scenario. Assume the same fact pattern as above, except that a prepayment for the agreed minimum purchase value is due at the start date of the agreement and needs to be made in US dollars. The prepayments will be offset against future supplies during the next 10 years.

Issues

• Does the foreign currency component in the purchase contract represent an embedded derivative that needs to be accounted for separately?

• If the foreign currency component does not need to be separated, how is the change in exchange rate to be reflected in the prepayment presented?

Resolution

Whether the foreign currency component needs to be separately accounted for depends on the specific facts and circumstances. We refer to 3.1 above for a discussion of this analysis.

In the event that the foreign currency component is separated, it is accounted for as a derivative. In this specific fact pattern, neither of the parties’ functional currencies (euros or rubles) is used for the purpose of the contract. However, in Russia and in international trade with Russia, it is acceptable that the US dollar is currently “a currency commonly used in the economic environment in which the transaction takes place.” Accordingly, the embedded foreign currency element in the contract (which fulfills the definition of a derivative under IAS 39) is closely related to the host contract and therefore not accounted for separately.

Alternative scenario. The prepayment is for the full minimum purchase value. There is no embedded foreign currency derivative in the purchase contract as the foreign currency amount is fully prepaid. The prepayment is a non-monetary item, and therefore, the historical cost requirements of IAS 21 The Effects of Changes in Foreign Exchange Rates apply for subsequent measurement. Significant exchange rate fluctuations may, however, give rise to a net realisable value adjustment in the event that the sales price of related products does not cover cost, also after considering selling costs. If the prepayment did not cover the full minimum purchase value, Sunshine would need to assess whether an embedded foreign currency derivative needs to be separated for the unpaid purchase value in the contract.

Besides the foreign currency issue, Sunshine needs to consider derivative accounting in case the raw material in question represents a commodity and the contract provides for volumetric flexibility. In this case, the volumetric flexibility could give rise to a written option. The written option is accounted for as a derivative measured at fair value under IAS 39.
SolarWorld AG reports on long-term prepayments made to suppliers in foreign currency as follows:


Some of the current prepayments recognised in inventories were paid in USD. Measurement was carried out at historic rate at payment date because the prepayments are non-monetary items in terms of IAS 21.16.

3.3 Contingent (acquisition) cost for property, plant and equipment

Fact pattern
Sunshine acquires machinery, a new and untested technology, in order to produce thin film solar cells under a contingent cost arrangement. Legal ownership and risks and rewards on the machinery pass to Sunshine. Deferred payments are required as a percentage of revenue exceeding a minimum threshold for a certain time. The arrangement is mainly for the following reasons:

- The machinery as procured is not ready for use and needs significant effort to customise it to Sunshine’s production needs.
- Sunshine did not have sufficient cash on hand to fund the entire purchase price.
- The supplier of the machinery wanted to enter the solar technology market and therefore was willing to invest via deferred payments and reduced prices. By doing so, it gained experience and opened a potential new market.

Issue
- How does Sunshine determine the cost of the property, plant and equipment and account for the deferred payment arrangement?

Resolution
The contract does require Sunshine to pay additional cash if revenue exceeds a certain threshold. This escalation clause might represent an (embedded) derivative and could require separate accounting as a financial instrument at its fair value. The cost of the property, plant and equipment, therefore, depends on whether an embedded derivative exists and is separately accounted for.

In the current version of IAS 39, the definition of a derivative is somewhat unclear. It allows some limited flexibility in the event that a “non-financial variable specific to a party to the contract” is involved. But IAS 39 is not fully clear on what is meant by a non-financial variable. In practice, in the absence of clear guidance, contingent payments based on EBIT\(^1\) or EBITDA\(^2\) are often regarded as non-financial and, as such, are often not classified as derivatives.

\(^1\) EBIT is net earnings before interest and taxes.
\(^2\) EBITDA is net earnings before interest, taxes, depreciation and amortisation.
The implementation guidance for IAS 39 states that derivatives based on sales volume are not excluded from the scope of IAS 39. Under this notion, it would be appropriate to account for the sales-based contingent payment as an embedded derivative that should be separated. Accordingly, the embedded derivative’s initial fair value would be added to the other components of cost of property, plant and equipment and recorded as a liability. The embedded derivative would subsequently be measured at fair value with changes accounted for through profit or loss.

Given the divergent views, it is currently acceptable not to separate the contingent element under certain circumstances. Accordingly, the cost of property, plant and equipment would initially take into account the estimated contingent payments at their present value if the cost of the machinery can be measured reliably, and it is probable that future economic benefits associated with the item will flow to Sunshine.

The accounting for subsequent changes in the contingent consideration is not clear either. This is currently an active project of the IFRIC that is expected to be finalised after the revised standard for leases is issued. Until further guidance is provided, we believe that companies can make a policy choice either to account for subsequent changes to estimated contingent payments through profit or loss or as an adjustment to the historical cost of the property, plant and equipment.
4. Research and development

As part of their steep growth phase, entities in the solar technology industry regularly spend large amounts on R&D activities for machinery, production, process related matters and products. IFRS requires capitalisation of development expenses when certain criteria are met. Hence, this is an area of major interest in the solar technology industry. IFRS prohibits capitalisation of research expenses. However, IFRS requires capitalisation of development costs under IAS 38 Intangible Assets when it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity and the cost of the asset can be measured reliably.

Excerpt from IAS 38, paragraph 57

An intangible asset arising from development (or from the development phase of an internal project) will be recognised if, and only if, an entity can demonstrate all of the following:

- The technical feasibility of completing the intangible asset so that it will be available for use or sale
- Its intention to complete the intangible asset and use or sell it
- Its ability to use or sell the intangible asset
- How the intangible asset will generate probable future economic benefits. Among other things, the entity can demonstrate the existence of a market for the output of the intangible asset or the intangible asset itself or, if it is to be used internally, the usefulness of the intangible asset
- The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset
- Its ability to measure reliably the expenditure attributable to the intangible asset during its development

As set out in paragraph 53 of IAS 38, “If an entity cannot distinguish the research phase from the development phase of an internal project to create an intangible asset, the entity treats the expenditure on that project as if it was incurred in the research phase only and recognises an expense accordingly.”

The recognition of an item as an intangible asset requires an entity to demonstrate that the item meets the definition of an intangible asset and the recognition criteria. This requirement applies to both costs incurred initially to acquire, or to internally generate, an intangible asset and those incurred subsequently to add to that asset, replace part of it or service it.

The nature of an intangible asset is such that, in many cases, there are no additions to such an asset or replacements of part of it. Accordingly, most subsequent expenditures are likely to maintain the expected future economic benefits embodied in an existing intangible asset rather than meet the definition of an intangible asset and the recognition criteria in this standard. In addition, it is often difficult to attribute subsequent expenditure directly to a particular intangible asset rather than to the business as a whole. Therefore, only rarely will subsequent expenditure (expenditure incurred after the initial recognition of an acquired intangible asset or after completion of an internally generated intangible asset) be recognised in the carrying amount of an asset.
### 4.1 Continuous development on existing products

**Fact pattern**
Sunshine spends significant amounts on improving the efficiency of its solar cells. In one scenario, the improvements relate to the optimisation of existing products using existing concepts and technology. In a second scenario, the development activities will redefine major separate areas in the production process and are expected to ultimately replace existing processes.

**Issues**
- Is Sunshine required to capitalise development costs?
- Is an impairment test required for related assets recognised?

**Resolution**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Do development costs need to be capitalised?</th>
<th>Is an impairment test required?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1.</strong> The improvements relate to the optimisation of existing products using existing concepts and technology. The observable improvements are minor and more or less represent continuous improvements.</td>
<td>The expenditure incurred by Sunshine has the character of maintaining the expected future economic benefit in the existing assets. Accordingly, capitalisation would not be allowed.</td>
<td>There are no specific impairment indicators. The continuous improvements in products and processes do not in themselves trigger an impairment test. However, if the background to the activities involves, for example, declining sales or margins, an impairment test would be required.</td>
</tr>
<tr>
<td><strong>Scenario 2.</strong> The development efforts are structured around a few defined areas of the current products and processes that are suboptimal. The development activities will redefine major separate areas in the production process and are expected to ultimately replace existing processes. This will go along with a significant redesign of the solar cells currently being produced.</td>
<td>Sunshine defined separate areas of activity. The activities will end in a replacement of existing processes. Therefore, the activities are aimed at creating one or more new intangible assets. Provided all other recognition criteria are met, Sunshine would be required to capitalise related expenses from the date it first meets the recognition criteria and include all directly attributable costs necessary to create, produce and prepare the asset to be capable of operating in the manner intended by management in the cost of the asset. The fact pattern is vague as to whether this would as well be required for solar cells being redesigned (or parts of them). Applying the above reasoning, capitalisation might therefore be necessary, although this is a matter of judgement.</td>
<td>Derecognition of the replaced items needs to be considered. In addition, an impairment test will probably be required for related items that are not derecognised</td>
</tr>
</tbody>
</table>
Entities in the solar technology industry regularly spend large amounts on R&D activities for machinery, production, process related matters and products. IFRS requires capitalisation of development expenses when certain criteria are met.

SMA Solar Technology AG points to capitalisation of development costs as a significant estimate as follows:

**Excerpt from 2010 Annual Report of SMA Solar Technology AG, p.173**

Development costs are capitalised in line with the accounting policies presented when all required conditions are given. Initial capitalization of costs is based on an estimate by management that a project’s technical and economic feasibility has been proven. This is normally the case when a development project has reached a specific milestone or a specific quality gate in the development process. When determining the amounts to be capitalised, management makes further valuation assumptions regarding the amount of expected future cash flows generated by the assets. With this in mind, €10.9 million (previous year: €7.2 million) were capitalised during the fiscal year. The increase in capitalization reflects the increasing development activities carried out by SMA in order to retain its technology leadership (p.173).

**4.2 Process and other improvements to property, plant and equipment**

Development activities may relate to either the physical asset or intangible asset(s). Expenses that can be capitalised under IFRS principles for property, plant and equipment would need to be separated from those under the principles for intangible assets.

Among other criteria, an intangible asset is recognised only if the entity has control over it.

**Excerpt from IAS 38, paragraphs 13 and 14**

13. An entity controls an asset if it has the power to obtain the future economic benefits flowing from the underlying resource and to restrict the access of others to those benefits. The capacity of an entity to control the future economic benefits from an intangible asset would normally stem from legal rights that are enforceable in a court of law. In the absence of legal rights, it is more difficult to demonstrate control. However, legal enforceability of a right is not a necessary condition for control because an entity may be able to control the future economic benefits in some other way.

14. Market and technical knowledge may give rise to future economic benefits. An entity controls those benefits if, for example, the knowledge is protected by legal rights such as copyrights, a restraint of trade agreement (where permitted) or by a legal duty on employees to maintain confidentiality.

Research expenses may not be capitalised and are taken to profit or loss as incurred.
Fact pattern
Sunshine acquires new machinery for the production of solar modules using a new thin film technology to be further developed into products using the available machinery. The existing machinery and potential products are not adapted to this new technology, and significant further development is required to enable ongoing production. While Sunshine bears the related cost, the manufacturer is heavily involved, and many subsequent improvements that relate to the machine can be used by the machine tool company to advance the capabilities of future products.

Issue
- Is Sunshine required to capitalise development costs?

Resolution
Since the costs relate to potentially recognisable intangible assets, Sunshine determines whether it has control. If Sunshine can prove control (e.g., through confidentiality agreements, patents or other means) and all further criteria for recognition of an internally generated intangible asset are met, Sunshine capitalises the development cost.
Entities investing in product development and production facilities in the solar technology industry inherently bear a significant risk. While product portfolios are not diversified, large capital expenditure is required. Hence, property, plant and equipment are of major importance to the entities in the industry and their financial statements.

Several accounting considerations can exist in this area including: determination of useful lives; residual values; component accounting; and impairment. Once made, assumptions on future development may then need to be revised to reflect the effects of some of the following: new technology; new products; substitute products; changes in the legal environment, including subsidisations schemes or delays; or challenges faced in internal projects. Such changes may well give rise to material adjustments to the respective asset’s accounting despite a generally favourable environment.

5. Property, plant and equipment, inventories and impairment

5.1 Determining useful life for new technology

As defined in IAS 16, useful life is either:

- The period over which an asset is expected to be available for use by an entity
- The number of production or similar units expected to be obtained from the asset by an entity

Useful life reflects expectations and, as such, is subject to estimates that are based on assumptions.

Fact pattern
Sunshine uses a technically innovative machine for which there is no historical experience of its useful life. Information provided by the manufacturer indicates a useful life of 12 years, assuming normal capacity usage. During the first few years of operation, the output of the machine is continuously increased and now exceeds the manufacturer’s normal level. Sunshine now believes it is probable that the machine will have a useful life of 14 years.

Issue
- How is useful life determined?

Resolution
Information provided by the manufacturer can be a factor to consider in determining a machine’s useful life, especially when a company has limited experience with that specific machine or the related technology. As such, Sunshine could assign a useful of 12 years to the machine.

As required by IAS 16, Sunshine needs to reassess the useful lives of property, plant and equipment, residual value and depreciation method at least at each financial year end and, if expectations differ from previous estimates, the change(s) will be accounted for as a change in an accounting estimate in accordance with IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors. As such, once Sunshine can substantiate that the machine’s useful life has increased to 14 years, it should modify its calculation of depreciation expense to incorporate the longer life of the machine. The impact of this change will be reflected in the financial statement on a prospective basis.
5.2 Impairment — delay in setting up a new facility

Entities assess at each reporting date whether there is any indication that an asset may be impaired. If any such indication exists, the entity must estimate the recoverable amount of the asset.

IAS 36 Impairment of Assets provides a list of impairment triggers to be assessed. In assessing whether there is any indication that an asset may be impaired, an entity will consider, at the minimum, the following indicators:

External sources of information:

- During the period, an asset’s market value has declined significantly more than would be expected as a result of the passage of time or normal use.
- Significant changes with an adverse effect on the entity have taken place during the period, or will take place in the near future, in the technological, market, economic or legal environment in which the entity operates or in the market to which an asset is dedicated.
- Market interest rates or other market rates of ROIs have increased during the period, and those increases are likely to affect the discount rate used in calculating an asset’s value-in-use and decrease the asset’s recoverable amount materially.
- The carrying amount of the net assets of the entity is more than its market capitalisation.

Internal sources of information:

- Evidence of obsolescence or physical damage of an asset is available.
- Significant changes with an adverse effect on the entity (in the extent, or manner in which, an asset is used or is expected to be used) have taken place during the period, or are expected to take place in the near future. These changes include: the asset becoming idle; plans to discontinue or restructure the operation to which an asset belongs; plans to dispose of an asset before the previously expected date; and reassessing the useful life of an asset as finite rather than indefinite.
- Evidence is available from internal reporting that indicates that the economic performance of an asset is, or will be, worse than expected.

Fact pattern

Sunshine started setting up a new facility in 2009. Production was planned to start in January 2010. As of year-end 2009, it was clear that a delay of six months was realistic. However, by 30 June 2010, the new facility was only producing a limited number of samples of substandard quality due to the unexpected incompatibility of the materials used in production with the capabilities of the facility. At that time, it was expected that production would be fully ramped up by the end of 2010. Serial production actually started in January 2011 with output significantly below the level originally expected for January 2010. By December 2011, the output reached the level originally expected for the beginning of 2010. Nevertheless, it is still below the level originally anticipated for December 2009.

Issue

- Does the delay trigger an impairment test for one or more of the reporting dates as of 1 December 2009; 30 June 2010; 31 December 2010; 30 June 2011; and 31 December 2011?
Resolution

Given rapid technical advances, learning curve effects, falling unit costs and rapid changes in the industry structure, we believe that the delay will significantly change cash flows in the short term and potentially in the longer term as well. The ongoing delays would, for example, give rise to changes in estimated revenue, cost and useful lives. They would affect the amount and the timing of the cash flows accordingly and might significantly affect the recoverable amount of the asset/cash-generating unit subject to an impairment test. This would be true for the reporting dates as of 31 December 2009; 30 June 2010; and 31 December 2010, since there is new information available for all of these dates. However, the fact pattern does not describe whether the assumptions considered at 31 December 2010 are still valid for the reporting dates of 30 June 2011 and 31 December 2011. If no new relevant information needs to be taken into account, no further impairment test would be required as of these dates.

5.3 Impairment – factoring in expected increase in margin and output

When determining the value-in-use estimates of future cash flows, Sunshine will include:

- Projections of cash inflows from the continuing use of the asset
- Projections of cash outflows that are necessarily incurred to generate the cash inflows from continuing use of the asset (including cash outflows to prepare the asset for use) and can be directly attributed, or allocated on a reasonable and consistent basis, to the asset
- Net cash flows, if any, to be received (or paid) for the disposal of the asset at the end of its useful life

As future cash flows are estimated for the asset in its current condition, value-in-use does not reflect future cash outflows that will improve or enhance the asset’s performance or the related cash inflows that are expected to arise from such outflows.

Until an entity incurs cash outflows that improve or enhance the asset’s performance, estimates of future cash flows do not include the estimated future cash inflows that are expected to arise from the increase in economic benefits associated with the cash outflow.

Estimates of future cash flows include future cash outflows necessary to maintain the level of economic benefits expected to arise from the asset in its current condition. When a cash-generating unit consists of assets with different estimated useful lives, all of which are essential to the ongoing operation of the unit, the replacement of assets with shorter lives is considered to be part of the day-to-day servicing of the unit when estimating the future cash flows associated with the unit. Similarly, when a single asset consists of components with different estimated useful lives, the replacement of components with shorter lives is considered to be part of the day-to-day servicing of the asset when estimating the future cash flows generated by the asset.

Fact pattern

Sunshine establishes a new facility based on a new thin film technology. Originally, production was planned to start in June 2011. Effectively, production started in December 2011 and output is significantly below the original planning figures. Sunshine expects that the output will increase in future periods and yields will increase accordingly. The improvements are planned to be achieved without improving or enhancing the asset’s performance beyond its current capabilities. Instead, the improvements relate to an optimised use of the existing
asset. For the purpose of impairment testing, Sunshine applies the value-in-use method first (and would only determine fair value less costs to sell if the value-in-use is below the asset’s carrying value).

**Issue**
- Can Sunshine factor in the expected development of output in its impairment test (value-in-use)?

**Resolution**
Sunshine may, in our view, include the effects of increasing output and yield since it does not require capital expenditure beyond normal maintenance. It will therefore include the effects of learning curves, optimised usage of existing facility, increased capacity usage and minor changes to the facility in line with day-to-day operational needs, as well as normally required replacements of parts of the facility with shorter useful lives.

### 5.4 Inventory measurement in ramp-up phase

The cost of conversion of inventories includes costs directly related to the units of production, such as direct labour. They also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods.

The allocation of fixed production overheads to the cost of conversion is based on the normal capacity of the production facilities. Normal capacity is the production expected to be achieved on average over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. The actual level of production may be used if it approximates normal capacity. The amount of fixed overhead allocated to each unit of production is not increased as a consequence of low production or idle plant. Unallocated overheads are recognised as an expense in the period in which they are incurred. Variable production overheads are allocated to each unit of production on the basis of the actual use of the production facilities. Accordingly, ramp-up inefficiencies and the cost of underutilisations are expensed and are not part of the cost of inventories.

**Fact pattern**
Following the initial start-up phase, production from Sunshine’s operations rises continuously. However, it has not yet reached a normal level, and production cost incurred divided by the number of units produced is still above sales price. At period-end, Sunshine determines the carrying amount of inventory.

**Issue**
- How is cost of inventory determined in a ramp-up phase?

**Resolution**
After determining the cost of its inventory, Sunshine will need to assess whether the net realisable value (NRV) of items in inventory is below carrying amount.
5.5 Inventory measurement – decline in supply prices and in product sales prices

Inventories must be measured at the lower of cost and net realisable value (NRV). The NRV is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale. NRV is entity-specific value and thus differs from fair value. Materials and other supplies held for use in the production of inventories are not written down below cost if the finished products in which they will be incorporated are expected to be sold at or above cost. However, when a decline in the price of materials indicates that the cost of the finished products exceeds NRV, the materials are written down to NRV. In such circumstances, the replacement cost of the materials may be the best available measure of NRV. Writing inventory down to NRV should normally be done on an item-by-item basis, but it may be necessary to write down an entire product line or group of inventories in a given geographical area that cannot be reasonably evaluated separately. Estimates of NRV must be based on the most reliable evidence available and take into account fluctuations of price or cost after the end of the period if this is evidence of conditions at the end of the period. Estimates of NRV must also take into account the purpose for which the inventory is held. Therefore, inventory held for a particular contract has its NRV based on the contract price, and only any excess inventory held would be based on general selling prices.

Fact pattern
Under its long-term supply contract with Sunshine, Module plc purchased solar cells (not a commodity) to be used for multiple products. Since the inception of the contract, current supply prices have dropped significantly and due to strong competition, Module plc is forced to reduce its sales prices. Based on the adjusted sales prices for its products, Module plc expects to incur losses for most of them. As of the reporting date, Module plc needs to determine the inventory’s NRV.

Issue
- How is NRV of inventory determined in this situation?

Resolution
Module plc needs to assess potential losses from firm commitments to be fulfilled and would consider related impairments in the value of the inventories. Excess inventory would then be assessed against general selling prices (less direct and incremental costs to complete and related sales costs). Module plc uses the solar cells for multiple products in the same product line and sells those in the same geographical area, and the inventories may not be reasonably evaluated separately. Accordingly, Module plc would group the inventories and determine NRV for the group against the estimated sales price (minus costs to complete and sales cost). Since the decline in sales prices goes along with the decline in prices for the major input factor solar cells, the replacement cost would, in our view, be an appropriate measure of NRV if the cost of the finished goods will exceed the NRV.

5.6 Industrial gas supply contract – embedded leases

Fact pattern
Sunshine (the purchaser) enters into an arrangement with a third party (the supplier) to supply a minimum quantity of gas needed in its production process for a period of 12 years. The supplier designs and builds a facility adjacent to Sunshine’s plant to produce the needed gas and maintains ownership and control over all significant aspects of operating the facility. The economic life of the facility is expected to be 15 years.
**Issue**

- Does the gas supply contract contain an embedded lease to be separately accounted?

**Resolution**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Does the contract contain a lease?</th>
</tr>
</thead>
</table>
| **Scenario 1.** The agreement provides for the following:  
- The facility is explicitly identified in the arrangement, and the supplier has the contractual right to supply gas from other sources. However, supplying gas from other sources is not economically feasible or practicable.  
- The supplier has the right to provide gas to other customers and to remove and replace the facility's equipment and modify or expand the facility to enable the supplier to do so. However, at the inception of the arrangement, the supplier has no plans to modify or expand the facility. The facility is designed to meet only the purchaser's needs.  
- The supplier is responsible for repairs, maintenance and capital expenditures.  
- The supplier must stand ready to deliver a minimum quantity of gas each month.  
- Each month, the purchaser will pay a fixed capacity charge and a variable charge based on actual production taken. The purchaser must pay the fixed capacity charge irrespective of whether it takes any of the facility's production. The variable charge includes the facility's actual energy costs, which amount to about 90% of the facility's total variable costs. The supplier is subject to increased costs resulting from the facility's inefficient operations.  
- If the facility does not produce the stated minimum quantity, the supplier must return all or a portion of the fixed capacity charge. | The arrangement contains a lease within the scope of IAS 17 Leases/IFRIC 4 Determining whether an Arrangement contains a Lease. An asset (the facility) is explicitly identified in the arrangement and fulfilment of the arrangement is dependent on the facility. Although the supplier has the right to supply gas from other sources, its ability to do so is not substantive. The purchaser has obtained the right to use the facility. This is because, on the facts presented – in particular, that the facility is designed to meet only the purchaser’s needs and the supplier has no plans to expand or modify the facility – it is unlikely that one or more parties other than the purchaser will take more than an insignificant amount of the facility's output. Moreover, the price the purchaser will pay is neither contractually fixed per unit of output, nor equal to the current market price per unit of output as of the time of delivery of the output. |
| **Scenario 2:** The fact pattern is generally the same as in Scenario 1. However, the plant is designed to allow an output that is beyond Sunshine’s requirements. The supplier intends to provide a significant part of its output to customers other than Sunshine. | The arrangement does not contain a lease within the scope of IAS 17/IFRIC 4. An asset (the facility) is explicitly identified in the arrangement, and fulfilment of the arrangement is dependent on the facility. However, the supplier can and intends to provide a significant part of the facility's output to other customers. The purchaser has not obtained the right to use the facility on the facts presented. In particular, although the facility is designed to meet the purchaser’s needs, it can provide substantial additional output to other purchasers. Therefore, it is expected that one or more parties other than the purchaser will take more than an insignificant amount of the facility's output. |
# Global cleantech leadership network

## Global Cleantech Center

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<th>Contact Information</th>
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<th>Location</th>
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</table>

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