

IN CONFIDENCE

**EVALUATION OF THE ELECTRONIC DESIGN
AUTOMATION TOOLS SUPPORT SCHEME
FOR START-UPS**

**Report to
Scottish Enterprise Edinburgh and Lothian**

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SCHEME FOR START-UPS**

**Report to:
Scottish Enterprise Edinburgh and Lothian**

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March 2006

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Executive summary

1. This is the report of a study undertaken by SQW Ltd on behalf of Scottish Enterprise Edinburgh and Lothian (SEEL) to evaluate and appraise the Electronic Design Automation (EDA) Tools Support Scheme for start-up companies. It was carried out during February 2006. The study forms one of a series of appraisals commissioned by SEEL as part of its framework agreement with SQW Ltd.

Purpose of study

2. The purpose of the study is to make an assessment of the EDA Tools Support Scheme and to evaluate its impact on the participating businesses with a view to informing SEEL's decision about the need for future support and intervention in this area.

EDA Tools Support Scheme

3. The EDA Tools Support Scheme for start ups provides access to high quality design software. This aims to provide small design companies with the capability not normally affordable to them in their early years. It seeks to enable them to develop to a more credible stage when they can attract support from the venture capital community for more serious growth. The Scheme began in 2003, got off the ground a year later and was due to finish, as licenses expired in April 2006. An extension to this date has been obtained.

Conclusions

4. The EDA Tools Scheme for Start ups is a valuable mechanism of providing access to high quality design software of considerable value to participating businesses. It is clear that design companies have achieved notable progress through their effective exploitation of the access provided by the scheme. This is because the Tools Scheme involves a leading edge vendor of international renown, is focussed on a very specific group best able to utilise it in full and on highly attractive terms not available by other routes.

EDA Tools Scheme - characteristics

5. The EDA Tools Scheme is an intervention with distinctive characteristics including:
 - it is targeted at a very specific client group and, in turn, is of value to a small group
 - it delivers a highly focussed type of support, that which aims to develop Scotland's electronics design capability among start up design firms
 - it is directed at young, growing firms with limited resources who have to be able to exploit the potential that access to EDA tools enables
 - it provides support widely recognised to be of the highest international quality from one of the world's leading EDA vendors
6. These features of the scheme provide an important qualification. The EDA Tools scheme is aimed at design electronics start ups. It is not feasible or reasonable to assess the full impact of this intervention on these firms. They are all at important phases in their development. Much of their potential has yet to be realised. EDA tools will help them build capability which, in turn, will assist in their future growth.
7. At this stage the companies have yet to demonstrate any serious growth, in terms of economic impact through sales, employment, and output and thereby GVA. Instead we have examined the contribution of the EDA Tools scheme on the participants' *potential* growth and development.

Programme effectiveness

8. The strategic context for the scheme is highly supportive. EDA Tools addresses a "gap" in the support system, of a particular nature, within a key industry offering long term potential to contribute to Scotland's economic development. SEEL has identified a well defined market failure and built an appropriate response.

Awareness and expectations

9. The majority of participating companies became aware of the scheme through their contacts and networks within both in the electronics industry and in Scottish Enterprise. One company became aware through their previous involvement with

Edinburgh Research and Innovation (ERI) that had helped them in the initial start-up stage.

10. The main expectation from the scheme was that use of highest quality tools would be provided. The use of such tools would enable the business to significantly enhance its design capability notably in helping the development and prototyping of products. This would help the business develop to where it would have credibility in obtaining venture capital funding.

Importance and impact of the scheme

11. The EDA Tools scheme provided by SEEL is considered by participant companies to be extremely important. Having access to EDA tools is considered critical to their business. The main benefits associated with the scheme relate to the credibility and quality of prototyping product design gained by companies when convincing the venture capital market. It has also brought forward the stage at which participant companies are in their business development. In particular the whole area of market validation has been enabled and accelerated. The scheme has increased the rate of their business evolution.
12. Overall, companies state the scheme has had a substantial impact on their business performance. The scheme has had the greatest impact on increased employment and reduction in costs. More Design Engineers who specifically rely on EDA tools as part of their job have been employed to date and will be employed in the future. However, for most companies any increase in sales have not been achieved mainly because they are in their infancy, designing and testing their technologies and not at the stage of creating sales.

Additionality

13. We consider that the findings outlined above mean that the EDA Tools scheme run by SEEL has a high degree of additionality. The key aspect of additionality for this scheme – that which would not have happened without it, falls under four inter-related areas. These include taking forward the technology; engaging with customers; winning over the venture capitalists and finally, all these elements contributing towards the business strategy.
14. There are alternatives available to the design businesses. None are considered to offer the quality and scope of the EDA Tools provided by Cadence. Free and low cost alternatives are not considered to be credible options for businesses on a critical growth path. In addition to the tools themselves, Cadence documentation and tech support were both highly regarded.

Other key findings

15. There is consensus among participant companies on which Vendors they would prefer to see involved in any new scheme. These include Cadence, Synopsis, Mentor Graphics and Magma. It is recognised that the successful design start-up will become an EDA Vendor customer with whom a long term relationship has already been begun to be created. This forms the strongest logic for any calculation of the long-term return to the EDA Vendor
16. On the whole companies tended not to quantify any form of time-frame for accessing any scheme. Nevertheless, those that did quantify considered three years to be a reasonable length of time. The length of time that should be allowed for accessing any scheme depends on whether the company is making profit, if it is, then access should be cut. Also, if the EDA tools are to be used for R&D rather than production then more time needs to be given for access.
17. The current scheme rules for categorising a start-up company are considered to be reasonable.

Silicon foundry

18. In answer to a specific question regarding silicon foundry demand, it was noted that multi project wafers at a silicon foundry have been used by most companies. Services offered by Europractice have also been used by some companies and will be used in the future. No particular barriers were identified in this area.

Recommendations

Development of a new scheme

19. This review has highlighted the main benefits to businesses resulting from their involvement in the EDA Tools Scheme for Start ups. SEEL is considering the possibility of supporting a successor scheme. We recommend that:
 - this valuable programme should be developed and enhanced to allow further benefit to companies and to Scotland accrue in the short, medium and long term
 - the current scheme criteria be retained, although some companies were concerned about the length in business criterion, there was general consensus that young, start up companies were in greatest need and benefit most from this assistance

- the emphasis on supporting companies producing innovative products in high growth high growth markets is ensured (as opposed to the exploration of technological e.g. research contracts markets) as these offer better, more sustainable prospects
 - a multi vendor programme is considered. This brings with it issues around training and awareness of the full range of Vendors, their tools and their respective capabilities
 - a demand led approach be adopted whereby EDA tools can be obtained according to business needs (we recognise this does not square with the importance attached to the relationship being developed with a chosen vendor) and involving a “pay per use” mechanism
 - the creation of a knowledge resource providing information relating to future prices of EDA tools. A degree of certainty is required for costing and business planning purposes. However, this may prove difficult as the Vendor may not want their pricing structures to be in the public domain as they are largely a matter of commercial confidentiality
 - a “bridging” period between having free or low cost for Cadence EDA Tools to having to pay the full price would be helpful
 - increased technical training support on the usage of EDA tools to utilise the full benefits.
20. Whatever the final elements are in any successor programme, it is essential that the features of the current scheme, ones that have made it highly successful and effective, are retained and enhanced.

1 Introduction

- 1.1 This is the report of a study undertaken by SQW Ltd on behalf of Scottish Enterprise Edinburgh and Lothian (SEEL) to evaluate and appraise the Electronic Design Automation (EDA) Tools Support Scheme for start-up companies. It was carried out during February 2006. The study forms one of a series of appraisals commissioned by SEEL as part of its framework agreement with SQW Ltd.

Purpose of study

- 1.2 The purpose of the study is to make an assessment of the EDA Tools Support Scheme and to evaluate its impact on the participating businesses with a view to informing SEEL's decision about the need for future support and intervention in this area

EDA Tools Support Scheme

- 1.3 The EDA Tools Support Scheme for start ups provides access to high quality design software. This aims to provide small design companies with the capability not normally affordable to them in their early years. It seeks to enable them to develop to a more credible stage when they can attract support from the venture capital community for more serious growth. The Scheme began in 2003, got off the ground a year later and was due to finish, as licenses expired in April 2006. An extension to this date has been obtained.

Methodology

- 1.4 A methodology was agreed at the outset with SEEL. It consisted of:
- briefing by the EDA Tools Scheme Project manager
 - a review of contextual documents
 - face-to-face and telephone interviews with Scheme participants.

- 1.5 All of those consulted were very open and constructive in discussing their views on the effectiveness of the EDA Tools Scheme. We are grateful to all who contributed. A list of the participating companies is given in Chapter Three of this report and a copy of the interview guide employed is attached in Annex A.

Structure of report

- 1.6 The remainder of this report is structured as follows:
- in chapter two we review the background to the development and operation of the Scheme
 - in chapter three we set out the perspectives of key participants in the Scheme
 - in the final chapter we present our conclusions and recommendations based on the evaluation

2 Background

2.1 In this chapter we provide an assessment of the background within which the EDA Tools scheme for start ups was developed and has operated.

Strategic context

2.2 Smart Successful Scotland places emphasis on growing businesses as a central plank to the Enterprise Network's activities.¹ It encourages this through the priorities of *greater entrepreneurial dynamism and creativity*, through *increased commercialisation of research and innovation* and through *global success in key sectors*.

2.3 In recognition of this, and reflecting its longstanding involvement with key industries, Scottish Enterprise has a strong focus on Micro and Opto Electronics. A strategy for the cluster sets *out to grow competitive and sustainable industries utilising microelectronics and optoelectronics technologies based on innovation, which enhance and exploit the research, design and development capabilities of businesses, research institutes and universities in Scotland*.²

2.4 Key strategic objectives are to:

- build critical mass in key market areas
- strengthen local and international networks
- develop a workforce for the future
- increase global competitiveness
- promote company creation, growth and sustainability in Scotland.

2.5 The whole area of support for Scotland's technology based businesses, especially those starting up and those commercialising research, has become a "busy" area for policy and

¹ Smart Successful Scotland, Scottish Executive, 2004

² Micro and Opto Electronic Cluster Review and Strategy, Scottish Enterprise, 2004

initiatives. Considerable investment has been made by the Scottish Executive and the Network in such as SMART/SPUR/SCORE/SEEKIT, Proof of Concept, the Co-investment Fund, Enterprise Fellowships, ITIs and other high profile schemes.

- 2.6 The strategic context for the scheme is highly supportive. EDA Tools addresses a “gap” in the support system, of a particular nature, within a key industry offering long term potential to contribute to Scotland’s economic development.

Electronic Design Automation

- 2.7 Electronic design automation (EDA) is the grouping of tools for designing and producing ranging from printed circuit boards to integrated circuits. EDA’s role in chip design is due to the complexity of doing so by hand.³ Many EDA tools users are design service companies who use EDA software to evaluate design for manufacture. Tools contribute to and enable processes such as design and architecture, simulation, formal verification, design for “manufacturability” enabling working prototypes to be built.

- 2.8 As such complexity and sophistication implies, tools are highly specialist and expensive. The kind of research and, in particular, ongoing development costs involved lead to there being a small number of leading vendors able to commit sustained investment. The leading EDA companies are

- Cadence Design Systems
- Synopsis
- Mentor Graphics
- Magma Design Automation

- 2.9 Cadence is the world’s largest provider of EDA products and services. *“Its solutions provide the fastest way to design high-performance electronic systems and integrated circuits. That’s why the vast majority of semiconductor, computer systems, communication equipment and consumer electronic companies choose Cadence.”*⁴

³ Electronic Design Automation – EDA Tools Forum, University of Southampton, 2004

⁴ www.cadence-europe.com

- 2.10 Cadence was the first tenant at the Alba Centre, the heart of the Network's support to the electronic design community.

The EDA Tools Scheme

- 2.11 The Scheme seeks to provide an answer to a challenge faced by start up chip design companies. Namely, how they can afford to invest in the capability required to get their relatively high specification designs to the market. As start ups they lack the trading record and the available capital (full costs EDA tools run to six figures) to achieve this on their own.
- 2.12 SE's own internal appraisal process identifies the "vicious circle" whereby companies are unable to raise finance for growth as they are unable to support the investment which will demonstrate they have the potential to grow. Typically, in the absence of a working prototype neither potential customers, nor, more immediately, venture and investment capital providers can be convinced that the company should be treated seriously. Access to EDA tools enables small design businesses to be credible to both these audiences.
- 2.13 In support of the priority of encouraging electronic design capability, the Network acted as a "wholesaler", contracting with Cadence Design Systems to obtain a group of licenses at no charge. SE has valued these licences at over £3m, in terms of their full cost to design start ups. The cost to SEEL of a further licensing agreement was £150K with half of this cost being recovered by participating companies⁵.
- 2.14 The scheme is notable by the fact that it seeks to provide benefits to users and it also has to secure gains for the vendor. There is an element of market development for Cadence, and in any future scheme, for all vendors whereby it is recognised by all that their engagement has to lead to business benefits through the development of close relationships with new, small customers offering longer term potential. SEEL has sought to manage this aspect of the scheme with a degree of care.

⁵ SEEL Approval Paper, - Micro/ Opto Electronics Team, Nov 2005.

3 EDA Tools Scheme – user perspective

3.1 In this chapter we provide an assessment of the effectiveness of the EDA Tools scheme from the perspective of the user companies. In particular we investigate how companies became aware of the scheme; the impact it has had on their business performance; the additionality of the support provided. We then look ahead into the shape and demand of any future scheme.

Scheme participants

3.2 We contacted six participant companies to find their views of the EDA Tools scheme. All six companies gave their perspective of the scheme to varying depth and detail. One company was not available to provide a full consultation but did provide some very brief views on the scheme. Table 3.1 provides a list of these companies with a description on the nature of their business.

Table 3.1 EDA Tools scheme participants	
Company	Nature of business
Criticalblue Ltd	Deliver “Cascade” an embedded system design tool used by semiconductor and system design companies. Cascade minimises project risk and development time by leveraging the existing design tools and infrastructure
Dukosi Ltd	A chip design company specialising in integrated circuit design for short range wireless communications and mixed-signal applications
Spiral Gateway	Semiconductor company providing patent protected, innovative technology that reduces the power consumption of digital devices
Gigle Semiconductor	A fabless semiconductor company, developing system-on-chip integrated circuits that target the market for home multimedia networks.
XiPower	A power and battery management solutions provider, specialising in embedded microelectronics technology for use in the mobile technology market
Elonics Ltd	Semiconductor design consultancy, specialising in developing analogue/mixed-signal silicon devices

Use of scheme

3.3 Across the six companies 48 out of 51 (94%) EDA Tools licenses available via the scheme have been taken up to date from April 2003. The end date for the scheme was April 2006, but a new licensing agreement was reached enabling all (existing and new) licenses to run for their full 1 year term and removing the April 2006 termination date. However, participating companies had to pay a nominal cost for this extension.

Awareness of scheme

3.4 We asked participating companies how they became aware of the EDA Tools scheme run by SEEL. Companies were also asked how they got involved in the scheme. This was mainly through contacting SEEL once they became aware that this scheme existed. Some of the ways in which they became aware of the scheme are as follows:

- through previously working for Cadence and having links with SEEL; thus having prior knowledge of the scheme
- by being involved with Edinburgh Research and Innovation (ERI) who helped in setting-up one company. ERI informed this company of the scheme
- through personal networks in the electronics industry and in SEEL. There is a strong awareness that Cadence EDA Tools are the best available and when the opportunity arose going to SEEL was ideal solution.

3.5 **The majority of participating companies became aware of the scheme through their contacts and networks within both in the electronics industry and in Scottish Enterprise. One company became aware through their previous involvement with Edinburgh Research and Innovation (ERI) that had helped them in the initial start-up stage.**

Expectations form the SE scheme

3.6 The main expectation from the scheme was that the use of highest quality tools would be provided. This would help the business develop to where it would have credibility in obtaining venture capital funding. Simultaneously it would enable companies to produce a significantly improved end product, thus enabling them to compete more effectively. Another expectation was also to have some form of support infrastructure in place. For one company the expectation was also to receive help from the Institute of System level Integration (ISLI). Critically, these expectations were underpinned by the terms of the EDA tools licenses namely, there availability at no or low cost.

3.7 Companies were also asked to estimate how much they have spent on EDA Tools other than under the SEEL Tools scheme. The few companies which did provide a response to this question, stated that they obtained these tools largely for free and mainly from the open market. However, these considered to be of significantly lower quality.

- 3.8 **The main expectation from the scheme was that access to use high quality tools would enable the business to significantly enhance its design capability. This, in turn, would have a number of effects, notably in helping the development and prototyping of end products.**

Importance and impact of scheme

- 3.9 For all participating companies, the importance of the scheme is extremely high. Access to EDA tools is critical to their business development. Cadence EDA Tools are in very strong demand because they are considered to be the most technologically capable - the premier EDA Tools on the market.
- 3.10 The importance of EDA Tools is reflected in the fact that the business strategy of participating companies is based upon their ability to get as close to market readiness as possible. To convince the venture capitalist market and the end user, it is essential that companies are viewed as credible and are able to demonstrate that their designs work – at least at proto-type stage. Having access to Cadence EDA Tools provides both the credibility and quality end product. These benefits are of course dependent upon the SMEs involved making effective use of tools and their associated technological support and exploiting these in full.
- 3.11 In terms of the benefits of the scheme to participating companies, the following are the main advantages stated by scheme users:
- the Cadence EDA tools themselves have allowed SMEs to model future products and verify their designs in detail
 - allowed users to take risks and establish their business – enhanced business confidence
 - be more convincing when presenting to final investors
 - employ more skilled, degree qualified Designed Engineers
 - enabling the design of silicon chips which would not be possible without the scheme
 - provide productivity gains and “pre-packaged tool-kits”

- Cadence became aware of the customer company it was possible therefore for it to be able to establish a track record and create a positive reputation. Consequently, Cadence became more interested in the customer, and potentially when the scheme terminates there is a greater chance of obtaining Cadence Tools in the future
- the current stage at which participant companies are in their business development would not have been achieved. It has increased the process of their business evolution.

3.12 We asked companies what impact the scheme had on their business performance to date. Factors considered included increased sales, increased employment and any reduction in costs. Nearly all the companies found it difficult to quantify the measurable impact of the scheme in relation to sales and costs. Overall, companies do state the scheme has had a substantial impact on their performance.

3.13 As mentioned, for most companies any increase in sales have not been achieved. This is not surprising considering most of the companies are in their infancy designing and testing their technologies and not at the stage of creating significant sales. Nevertheless, one company did state that once they have passed the initial R&D stage there will be limited sales over the next three years. These are forecast to be approximately \$100K.

3.14 In relation to increased employment there has been a measurable positive impact. Half of the companies interviewed provided any form of quantifiable impacts, this included:

- one company currently employing 15 people of which 11 are Design Engineers relying on EDA tools
- one company employing 4 Design Engineers to date with a further 17 (10 in Scotland and 7 in Spain) are in the process of negotiating contracts. In terms of future growth, the total number of employees forecasted to be employed (Design Engineers and others) are c.40
- one company currently employs c.12 people including Design Engineers.

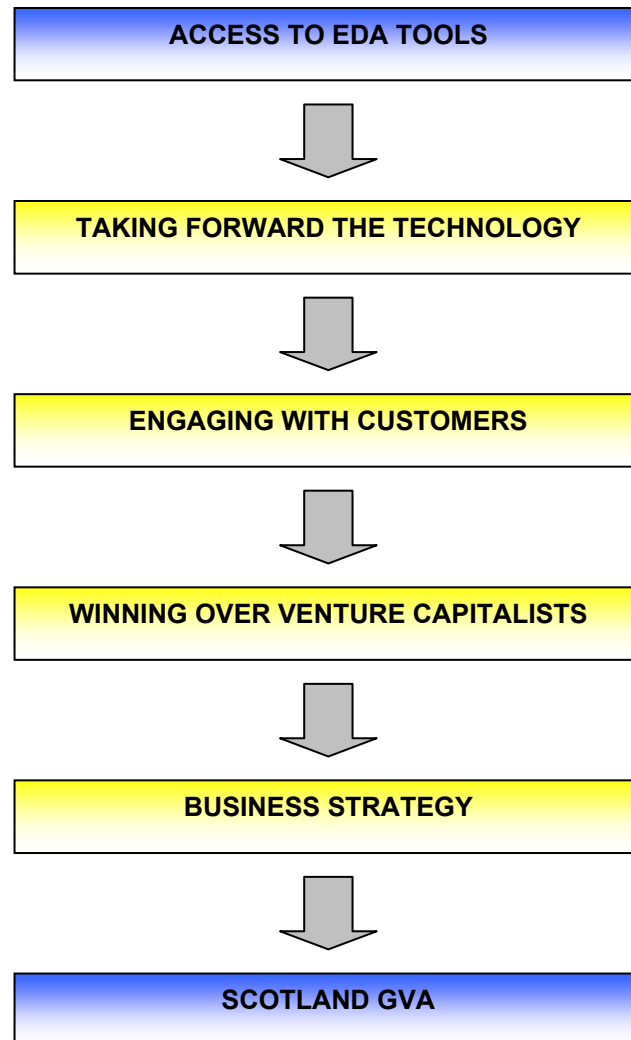
3.15 **The EDA Tools scheme provided by SEEL are considered by participant companies to be extremely important. Overall, companies state the scheme has had a positive impact on their business performance. The scheme has had the greatest measurable impact on increased employment.**

Additionality

- 3.16 For the three companies that were able to quantify some form of employment impact, this impact would not have been achieved without the scheme. While for those companies that did not quantify the impact but outlined the positive benefits and impacts in other ways, they also thought that the impact would not have been achieved without the scheme. Also, companies were unaware of any alternatives to the scheme in the UK or abroad. When asked what they would have done instead (the counterfactual) many stated that they would have obtained lower grade tools.
- 3.17 These are generally available for free or at some cost estimated to be in the range of c. \$50K - 350K. This would usually be financed through venture capital funding or through SMART grants. However, these tools would not have been of the same high quality of the Cadence tools.
- 3.18 It is important to bear in mind that as the EDA Tools scheme is aimed at chip design start ups, it is not feasible or reasonable to assess the full impact of this intervention on these firms. They are all at important phases in their development. Much of their potential has yet to be realised. EDA tools will help them build capability which, in turn, will assist in future growth.
- 3.19 Many other factors will influence the future. The key aspect of additionality for this scheme – that which would not have happened without it fall into four inter-related areas. These are depicted in Figure 3.1 below and explained as follows:
- **taking forward the technology** – access to tools allows the companies’ design intentions to be developed, trialled, verified and refined
 - **engaging with customers** – potential end users can be engaged when they see a process underway where credible design solutions are being worked on to a high standard
 - **winning over the venture capitalists** – again helping build credibility, this time with the financial community needing to be convinced that a business plan can be executed. Here successful prototypes are an essential element of any progress
 - **business strategy** – the start up phase is highly compressed – by time resources and demands placed on the SME. The combination of the above factors, with the business development skills of the managers, contributes hugely to the overall business strategy and associated plan

3.20 Having access to EDA tools allows the four inter-related areas mentioned above to come into play and then ultimately have a potential impact on the Scottish economy in terms of GVA.

Figure 3.1 Key factors influencing the future



3.21 Based on these findings, we conclude that the EDA Tools scheme run by SEEL to possess a high degree of additionality. The key aspect of additionality for this scheme – that which would not have happened without it falls under four inter-related areas. These include taking forward the technology; engaging with customers; winning over the venture capitalists and finally all these elements contributing towards the business strategy.

Future

- 3.22 The current scheme terminates in April 2006 with a one year extension being made available to access Cadence EDA Tools at a subsidised cost. This additional benefit will be utilised by the current scheme participants. This extension is viewed as critical to the company's long term growth prospects as there still exists a substantial difference between the subsidised price of the Cadence Tools offered through SEEL and the full price that Cadence will charge.
- 3.23 To access EDA Tools when the current scheme ends, companies intend or are already in the process of in direct contact with EDA Tools suppliers including Cadence to negotiate some form of agreement. There is consensus that already using Cadence EDA Tools secures their own business credibility and a strong advantage in obtaining finance from venture capitalists or SMART grants to pay for these EDA Tools.

Development of a new EDA Tools scheme

- 3.24 Participant companies were asked about their views on the development of a new scheme provided by SEEL and what ideas, if any, they had had on what this new scheme should offer to companies. It is important to state that there is potentially very strong demand among current participants for a new scheme with some companies having particular ideas on how the new scheme should develop. Table 3.2 below shows some selected verbatim quotes of their views.

Table 3.2 Views of participating companies on the development of a new scheme

What are your views on the development of a new scheme by Scottish Enterprise? Do you have any ideas on what this new scheme should offer?

1. *Any new scheme could help with "test & verification" – test equipment. This has been attempted before by SE but was not that successful. The development of any new scheme really depends on SEEL's objectives. There are two foreseeable options for SEEL:*
 - *To financially support small companies to explore technological markets. For this 3 years is enough or;*
 - *Support companies in producing innovative products in high growth markets*

I think SEEL's priorities should be in supporting companies in producing innovative products in high growth markets. Thus any new scheme run by SEEL should be tailored towards pursuing this objective.
2. *Not given a lot of thought to this, but the way the existing scheme has been set up has worked well. We would like some sort of follow up to this scheme. Perhaps some knowledge and certainty around future prices would help. This will help us in making a business case to*

potential investors mainly because when planning our business case, the range of uncertainty over cost of EDA tools can be huge.

- 3. Would like to see a "bridging" period once we come off the SEEL scheme and enter the market directly. In other words, the step from having free or low cost access to Cadence tools to having to pay the full market price can be huge. It would be helpful that SEEL try to bridge this gap in some way.*

SEEL could also help more with support and training, perhaps by having some form of arrangement whereby we could send some of our people to Cadence to get trained.

- 4. In any new scheme provided by SEEL we would like to see a number of Vendors from whom tools could be obtained according to our business needs. Something like a "pick and choose" system. It would also be useful if there was a "pay per use" mechanism. For example, there is a lot of usage of tools at designing at IP level but not at end level test. This latter stage could benefit from "pay per use".*
- 5. Demand for SEEL support is very strong. It's a "no brainer".*

3.25 The views of participant companies suggest that any new scheme developed by SEEL should have the following as part of its remit:

- a focus towards supporting companies in producing innovative products in high growth markets as opposed to supporting small companies wanting to explore technological markets
- knowledge and certainty in relation to future prices of EDA Tools
- some form of steps taken to bridge the gap between having free or low cost for Cadence EDA Tools to having to pay the full price - a form of "bridging" period
- more training support on the usage of EDA Tools, so that the full benefits of these tools can be utilised
- introduce a number of Vendors from whom EDA Tools could be obtained according to business needs. This would be complemented by a "pay per use" mechanism whereby different stages in the development of the product technology requires usage of EDA tools to varying degrees, thus a pay per use system can aid in paying for EDA tools in direct relation to level of usage.

Vendors

3.26 There appears to be some consensus among participant companies on which Vendors they would prefer to see involved in any new scheme. These are presented in Table 3.3 along with the main purpose for which they potentially might be used. These Vendors are considered to be the best in the quality of the EDA Tools provided. For some companies these Vendors are interchangeable and it does not matter too much which one they would get their technology from if they had to choose, while for other companies it is important which Vendor they buy their EDA Tools from. This is mainly because of the necessity to align the specific technological needs of their business with the capability of the specific EDA tools provided.

Table 3.3 Vendors that companies would like to see on a new scheme	
Vendor	Purpose
Cadence	For analogue
Synopsis	For digital
Mentor Graphics	For niche markets
Magma	-

3.27 In relation to what is considered to be a reasonable commitment or return to the EDA Vendor from the start-up, companies identified that while Vendors did have an “eye” on quarterly sales, they were concerned and willing to invest long-term. Therefore, one of the ways in which they improve their market share is by investing in start-ups; this can take various forms including taking a share in the start-up.

3.28 There is also the view that Vendors “get their teeth into you”. A very close relationship develops as the Vendor’s technology is absorbed into the work of the start-up. For example, Cadence tools run on Sun workstations using Solaris. Others use PCs running Linux. Cadence functions best on the Solaris platform. The start-up company learns, develops its understanding and ultimately builds its business around the EDA tools Vendor’s knowledge base.

3.29 Finally, it is recognised that the successful design start-up will become an EDA Vendor customer with whom a long term relationship has already been begun to be created. This forms the strongest logic for any calculation of the long-term return to the EDA Vendor.

Technical, business and design support

3.30 In terms of technical support provided as part of a new scheme, the majority of companies believe this to be an integral aspect of a new scheme. The majority will also be willing to work through an intermediary for this new support.

- 3.31 Generally, if design and business support was provided as a component of the new scheme through the EDA company or an incubator (on-site or off-site) then this would be welcomed by companies.

Length of time for accessing scheme

- 3.32 There were differing views on the period of time participating companies believed that should be allowed to access any scheme. Profit was considered to be an important part in the equation, once a company making profit then it is reasonable to stop having access to the scheme. On the whole though companies tended not to quantify any form of time-frame, those that did considered three years to be a reasonable length of time.
- 3.33 There was also the view that the period of time depended on what the company was targeting. Are the EDA tools to be used for R&D or for production? If it is for production then perhaps at that stage companies do not need the scheme as much, but if it still is at the R&D stage then they will need access.

Current scheme criteria

- 3.34 The current scheme rules are that the start ups should not:
- be more than three years old
 - be owned by another company and
 - have above £50K expenditure on EDA tools
- 3.35 These rules were not considered to be unreasonable by companies. None of the companies questioned stated that they themselves had any problems or envisage other companies would have problems with eligibility.

Silicon foundry

3.36 The majority of companies have used multi project wafers at a silicon foundry as a result of using EDA tools. On average companies had used a foundry two or three times. No problems were cited by companies in using a foundry. Other key findings in this area:

- one company had used an IBM foundry twice over a two year period. The value of such contracts being \$80-\$85K in total; the first one was \$20-\$25K and the second one was \$60K
- services offered by Europractice have been used by some companies to manufacture devices.
- one company has used services offered by Europractice for three projects
- companies are likely to be using services offered by Europractice in the future on relatively frequent basis
- Europractice is provided at a lower cost to university academics as compared to other users like start-up companies. It would be considered helpful if SEEL were able to negotiate so that Europractice can be offered at a lower cost
- reference was made by some companies to the “MOSIS” integrated foundry service run in the USA as a good quality counterpart to other foundries such as IBM⁶.

3.37 **The above findings suggest that participating companies are already using and reasonably comfortable with both multi project wafers at a silicon foundry and services provided by Europractice.**

⁶ For information on MOSIS, see <http://www.mosis.org>

4 Conclusions and recommendations

- 4.1 There are a number of key conclusions regarding the impact of the scheme as it stands and recommendations for any successor initiative. These are summarised in the following section.

Conclusions

- The EDA Tools Scheme for Start ups is a valuable mechanism of providing access to high quality design software of considerable value to participating businesses. It is clear that design companies have achieved notable progress through their effective exploitation of the access provided by the scheme. This is because the Tools Scheme involves a leading edge vendor of international renown, is focussed on a very specific group best able to utilise it in full and on highly attractive terms not available by other routes.

EDA Tools Scheme - characteristics

- The EDA Tools Scheme is an intervention with distinctive characteristics including:
 - it is targeted at a very specific client group and, in turn, is of value to a small group
 - it delivers a highly focussed type of support, that which aims to develop Scotland's electronics design capability among start up design firms
 - it is directed at young, growing firms with limited resources who have to be able to exploit the potential that access to EDA tools enables
 - it provides support widely recognised to be of the highest international quality from one of the world's leading EDA vendors

- These features of the scheme provide an important qualification. The EDA Tools scheme is aimed at design electronics start ups. It is not feasible or reasonable to assess the full impact of this intervention on these firms. They are all at important phases in their development. Much of their potential has yet to be realised. EDA tools will help them build capability which, in turn, will assist in their future growth
- At this stage the companies have yet to demonstrate any serious growth, in terms of economic impact through sales, employment, and output and thereby GVA. Instead we have examined the contribution of the EDA Tools scheme on the participants' *potential* growth and development.

Programme effectiveness

- The strategic context for the scheme is highly supportive. EDA Tools addresses a “gap” in the support system, of a particular nature, within a key industry offering long term potential to contribute to Scotland’s economic development. SEEL has identified a well defined market failure and built an appropriate response.

Awareness and expectations

- The majority of participating companies became aware of the scheme through their contacts and networks within both in the electronics industry and in SEEL. One company became aware through their previous involvement with Edinburgh Research and Innovation (ERI) that had helped them in the initial start-up stage
- The main expectation from the scheme was that use of highest quality tools would be provided. The use of such tools would enable the business to significantly enhance its design capability notably in helping the development and prototyping of products. This would help the business develop to where it would have credibility in obtaining venture capital funding.

Importance and impact of the scheme

- The EDA Tools scheme provided by SEEL is considered by participant companies to be extremely important. Having access to EDA tools is considered critical to their business. The main benefits associated with the scheme relate to the credibility and quality of prototyping product design gained by companies when convincing the venture capital market. It has also

brought forward the stage at which participant companies are in their business development. In particular the whole area of market validation has been enabled and accelerated. The scheme has increased the rate of their business evolution

- Overall, companies state the scheme has had a substantial impact on their business performance. The scheme has had the greatest impact on increased employment and reduction in costs. More Design Engineers who specifically rely on EDA tools as part of their job have been employed to date and will be employed in the future. However, for most companies any increase in sales have not been achieved mainly because they are in their infancy, designing and testing their technologies and not at the stage of creating sales.

Additionality

- We consider that the findings outlined above mean that the EDA Tools scheme run by SEEL has a high degree of additionality. The key aspect of additionality for this scheme – that which would not have happened without it, falls under four inter-related areas. These include taking forward the technology; engaging with customers; winning over the venture capitalists and finally, all these elements contributing towards the business strategy
- There are alternatives available to the design businesses. None are considered to offer the quality and scope of the EDA Tools provided by Cadence. Free and low cost alternatives are not considered to be credible options for businesses on a critical growth path. In addition to the tools themselves, Cadence documentation and tech support were both highly regarded.

Other key findings

- There is consensus among participant companies on which Vendors they would prefer to see involved in any new scheme. These include Cadence, Synopsis, Mentor Graphics and Magma. It is recognised that the successful design start-up will become an EDA Vendor customer with whom a long term relationship has already been begun to be created. This forms the strongest logic for any calculation of the long-term return to the EDA Vendor
- On the whole companies tended not to quantify any form of time-frame for accessing any scheme. Nevertheless, those that did quantify considered three years to be a reasonable length of time. The length of time that should be

allowed for accessing any scheme depends on whether the company is making profit, if it is, then access should stop. Also, if the EDA tools are to be used for R&D rather than production then more time needs to be given for access

- The current scheme rules for categorising a start-up company are considered to be reasonable

Silicon foundry

- In answer to a specific question regarding silicon foundry demand, it was noted that multi project wafers at a silicon foundry have been used by most companies. Services offered by Europractice have also been used by some companies and will be used in the future. No particular barriers were identified in this area.

Recommendations

Development of a new scheme

4.2 This review has highlighted the main benefits to businesses resulting from their involvement in the EDA Tools Scheme for Start ups. SEEL is considering the possibility of supporting a successor scheme. We recommend that:

- this valuable programme should be developed and enhanced to allow further benefit to companies and to Scotland accrue in the short, medium and long term
- the current scheme criteria be retained, although some companies were concerned about the length in business criterion, there was general consensus that young, start up companies were in greatest need and benefit most from this assistance
- the emphasis on supporting companies producing innovative products in high growth high growth markets is ensured (as opposed to the exploration of technological e.g. research contracts markets) as these offer better, more sustainable prospects

- a multi vendor programme is considered. This brings with it issues around training and awareness of the full range of Vendors, their tools and their respective capabilities
- a demand led approach be adopted whereby EDA tools can be obtained according to business needs (we recognise this does not square with the importance attached to the relationship being developed with a chosen vendor) and involving a “pay per use” mechanism
- the creation of a knowledge resource providing information relating to future prices of EDA tools. A degree of certainty is required for costing and business planning purposes. However, this may prove difficult as the Vendor may not want their pricing structures to be in the public domain as they are largely a matter of commercial confidentiality
- a “bridging” period between having free or low cost for Cadence EDA Tools to having to pay the full price would be helpful
- increased technical training support on the usage of EDA tools to utilise the full benefits.

4.3 Whatever the final elements are in any successor programme, it is essential that the features of the current scheme, ones that have made it highly successful and effective, are retained and enhanced.

APPENDIX A

INTERVIEW GUIDE

Evaluation and Appraisal of Electronic Design Automation (EDA) Tools Scheme

Interview Guide

1. Name; position of consultee; length of time in post

Before Joining the EDA Tools Scheme

2. How important is it for your company to have access to EDA tools?
3. How did you become aware of the EDA tools scheme run by SE?
4. How did you become involved in the scheme?
5. When did your company licensing agreement start?
6. Before joining the scheme did you have access to EDA tools?
 - a. If yes, through which "provider" and how did they find this?
 - b. If no, what was the reason for this?
7. What were your expectations from the SE scheme?
 - c. Were these subsequently met?
 - d. If yes, how? If not, why not
8. Can you estimate how much your company has spent on EDA tools other than under the SE tools scheme run by SE?

Impact of being on the EDA Tools Scheme

9. How important is it for your company to be on the SE EDA tools scheme?
10. What have been the benefits of being on the scheme? What has it allowed you to do?
11. What impact has this EDA tools scheme had on your business performance to date and in 3 years time in terms of the following (*try to quantify if possible*):
 - e. Increased sales
 - f. Increased employment
 - g. Reduced costs
12. Would this impact have been achieved if there was no SE EDA tools scheme?
 - h. If yes, how much and in what way?
13. What alternatives are there if this scheme did not exist – Are you aware of similar types of schemes?
14. What would you have done if this scheme did not exist?
15. If you would have accessed EDA tools some other way in the absence of this scheme, can you:
 - i. Estimate how much this may have cost?
 - j. How you would have financed this cost?
16. Are there any other benefits which can be attributed to the SE scheme (Please explain)?

Future

17. When does your company's licensing agreement come to end?
18. What do intend on doing or are already doing to maintain your access to EDA tools when your current scheme with SE ends?
19. How will you be paying for EDA tools when this scheme ends?
20. How important is it to your company for SE to intervene and provide EDA tools at lower cost?
21. What are your views on the development of a new scheme by SE? Do you have any ideas on what this new scheme should offer?
22. What level of cost would make EDA tools unaffordable for your company?
23. What Vendors would like see involved in the new scheme?
24. How important is Tech Support as part of this new scheme?
25. Would you be willing to work through an intermediary for this new support?
26. If it was offered, how valuable would design/ business support be as component of the scheme provided by:
 - k. the EDA company?
 - l. an "incubator" (either on-site or off)?
27. Do you believe that the current scheme rules for categorising a start-up are reasonable, specifically in terms of:
 - m. being more than 3 years old?
 - n. be owned by another company?
 - o. have above £50K expenditure on EDA tools?
28. For what period of time do you think a company should be allowed to access the scheme?
29. What do you consider to be a reasonable commitment/ return to the EDA Vendor from the start-up?

More technical aspects:

30. Has the outcome of your use of EDA tools ever resulted in using multi project wafers at any silicon foundry? If yes,
 - p. How often and what is the value of such contracts?
 - q. What problems, if any, did your company have in using a foundry
 - r. Has your company ever used services offered by Europractice to manufacture devices?
 - i. **If yes**, what are these services and with what frequency do you use them?
 - ii. **If not**, why not?
31. How likely and with what frequency would you use such services in the future?

Background questions – How many design engineers employed by your company?
How many of these engineers are dependent on EDA tools in order to their job?
Company details including age, product/ service, turnover, markets, future growth prospects.