

TRITEC
TECHNOLOGY REALISATION THROUGH INNOVATIVE TRILATERAL
ENTERPRISE COLLABORATIONS

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1 Corporate Venturing

1.1 Origins

Corporate Venturing (CV) may be defined as “a formal, direct relationship, usually between a larger and a smaller company, in which both contribute financial, managerial and/or technical resources, sharing risks and rewards equally for mutual growth” [1]. Basically CV is a strategy by which existing large companies invest in the creation of innovative ventures aiming at financial as well as strategic returns [2]. There are many other related motivations for established larger companies to embark on CV programmes, such as securing growth and responding to competitive pressure [3], improving corporate profitability [4, 5, 6], generating strategic renewal [7], seeking new ways to be innovative and flexible [8], and identifying new business ideas [2, 3, 9]. Strategic motivations though dominate the scene of corporate venturing motivation as a recent US survey suggests [10].

CV may take three broadly distinct forms: alliances, internal venturing programs, and corporate venture capital [11]. Alliances are a joining of forces between a large company and a Small or Medium Enterprise (SME), where the large company acquires a minority share of the SME or takes a minority participation in a third company made up by both parties. Internal venturing programs are set to use efficiently the internal resources of a large company in order to provide an entrepreneurial environment organised in an independent fashion [12]. Corporate venture capital is the name given to investments made by large companies accompanied by Venture Capital (VC) firms as co-investors in start-up enterprises [13].

Corporate ventures initiatives are set up to explore possible applications of one or several technologies owned by SME's. They bring about a match between the assets of the large companies (capital, distribution channels, brand names, etc.), with the flexibility and technical knowledge of the SMEs [11]. Large companies seek to gain through the linkage between new technologies and markets more quickly and at lower costs than by in-house

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development, and for SMEs the investment is often the key to overcoming barriers to product refinement and market entry and development.

CV activities began in the mid 60s in the USA taking several different forms [14]. In some cases daring strategies were followed, such as corporations providing direct funding for start-up companies that were already receiving investments from VC firms. Some corporations were also funding VC firms that would then invest the funds in new companies according to their own investment criteria. In other cases corporations created internal venture programmes, sponsoring innovative projects suggested by their staff [15]. These new developments in financing potentially high growth opportunities in SMEs slowed dramatically in 1973 when the Initial Public Offering (IPO) market, the main exit for these investments, collapsed due to poor returns from SMEs.

CV was brought back to the US business scene in the late 70s and early 80s. This was mainly due to technological reasons (personal computer and other technologies were emerging at the time creating opportunities for new business ventures), and also due to regulatory incentives for venture capital funding (the reduction of top capital gains tax rate in 1978 and the revision of regulations pension funds in 1979) [16]. The level of CV funding and the numbers of investments increased dramatically reaching approximately \$2 billion and almost 12% of venture capital investments by 1986. In this period investment opportunities were not as broad as in the previous cycle and were concentrated on pharmaceutical and high-tech companies. This stage ended with the 1987 stock market crash that triggered an unprecedented divestment of CV funds.

CV was reborn again in the 90s with the success of the *dot.com* and telecommunications companies. Large companies were at this stage seeking new product development opportunities through acquisitions, collaborations with universities and joint ventures. A new phenomenon emerged at that time: the partnership between venture capitalists and large corporations. The saturation of the venture capital market and the refocusing of business strategies on new dimensions, such as the customer-relationship management, made venture capitalists realise their limitations [15]. The solution sought was to collaborate with large companies in order to obtain the knowledge and experience needed to improve their own skills [17].

However, the over-optimistic belief that almost any Internet or communication related business would be successful caused a very rapid growth of the capital of *dot.com*, networking, communication, and software companies. Capital was abundant then and companies with new and untapped business ideas were able to obtain funding as VC firms rushed to get a share in potential "break-through" technologies. This led to the speculation bubble of 1998/2000 which in 2001 had burst. The effect of the burst was another collapse of the IPO market in the US. Corporate venture funding suffered a dramatic downturn reflecting investors' feelings about the market's volatility and uncertainty. Annual investment fell from \$17bn to \$1.2bn between 2000 and 2003 [18].

1.2 The European Experience

Introduced by American companies, corporate venturing emerged in Europe during the 90s. The first report on the activity sponsored by the European Commission was published in 1999 [19] and in 2001 the European Venture Capital Association (EVCA) published the first pan-European survey on CV [20].

In the late 90s the annual CV investment was in excess of €1bn or 10 percent of total venture capital disbursements in Europe and was mainly directed to early stage SMEs, for whom equity financing was more difficult to find. Geographically the activity was concentrated in France, Germany, Scandinavia, and the UK [20].

The bubble burst of 2001 resulted in a dramatic reduction of European investment activity for the same reasons as those that caused the downturn in the US. By 2002 the investment level was cut to €37mn, and the number of deals were reduced by 47%, compared with 2000. A modest recovery to €470mn was observed in 2003 though the number of deals dropped slightly to 315 from 337 in 2002 [21]. By 2002 the US CV investment levels are also picking up [10].

2 TRITEC project

2.1 The CBI Study and the TRITEC proposal

In 1999 CV practice in the UK was the subject of a study sponsored by the British Department of Trade and Industry, the Confederation of British Industry, and the NatWest Bank [1]. According to the findings of the study, CV practice was not well developed in the UK due to insufficient awareness of the benefits of CV among potential partners as well as the lack of practical support to initiate and to cultivate CV partnerships at their early stages.

A major inhibitor of CV activity appeared to be the absence of corporate funds with which to finance the requirements of SMEs. Only a few very large companies had the means or inclination to provide the necessary financial support to the partnerships. So, many medium sized corporations, who might arguably most benefit from the infusion of new ideas and technology from SME partners were deprived of the benefits of corporate venturing.

On the other hand, the report noted that the availability of traditional VC funds was in excess of what the market was demanding for the development of innovative products and services.

Thus, introducing a third party in the CV equation, namely a separate source of VC, could be an answer to the funding obstacle identified by the study. Thus, the concept of a trilateral alliance between an SME, a corporation and a VC firm was conceived. And in September 2000 it became the basis of a R&D project proposal submitted to the Fifth European Community Framework Programme for Research, Technological Development and Demonstration activities by a group of European organisations [22]. This project, named TRITEC (Technology Realisation through Innovative Trilateral Enterprise

Collaborations), was approved for co-financing in November 2000 and, after completion of contractual procedures, commenced in August 2001.

The purpose was to research, develop, test, and demonstrate mechanisms designed to stimulate and facilitate new partnerships between innovative, technology based SMEs; appropriate corporate partners; and sources of VC. Such trilateral corporate ventures, which would bring together the resources and practices across several European countries, would help to unlock the potential European market for innovation of products and services.

The inclusion of a VC firm in the traditional corporate venturing programmes, besides making possible the realisation of projects that otherwise could remain unexploited, would also help to reduce the investment risk of the larger firm by sharing the financial burden with the VC firm. Additional managerial support and access to the network of relations of the VC firm were also viewed as assets from which the partnership could take advantage.

For the VC firms such a trilateral arrangement would also offer benefits. The sponsorship of a larger firm would help to reduce the risk of the investment both as regards the soundness of the technology (large companies have the resources to perform technical due diligences on the SME, to validate the proposed technology, to help in designing process improvement programmes, and to provide R&D and engineering support to the venture), as well as in getting the products to the market and generating revenues (by providing customers reference for the technology and product performance, by making available global distribution channels and after sales support and by providing managerial, marketing and branding support).

Furthermore, the participation of a larger firm in the deal provides an additional benefit for the VC concerning provision of a suitable exit route through trade sale of the successful venture to the larger company alliance partner. This possibility is particularly relevant in Europe where the VC market and the management of investment exit strategies is quite underdeveloped when compared with the US [23]. With the exception of the UK market, the European VC firms have favoured the trade sales exit, as opposed to the IPO alternative. In any event the incidence of IPOs fluctuates dramatically with market conditions. In 2001 33.5% of the total amount of divestment was made through trade sales and 23.8% was through IPOs [20].

The project proposal also addressed other specific needs, cultural and economic differences, and goals of the participants in such partnerships in order to be able to develop generic mechanisms capable of addressing possible barriers.

2.2 A market driven initiative

The TRITEC project aimed to promote the value of CV as a mechanism for the successful exploitation of new European technologies in global markets. A market driven approach to its implementation was deemed more appropriate than a technology push model. Thus, the TRITEC project was guided by the technology needs of larger firms,

which are reflections of their understanding of emerging, wider market requirements. In this way the alliance-building processes could be developed in a more transferable, flexible and sustainable fashion, and disseminated more widely [24].

The initial step was to recruit large industrial companies willing to collaborate with the project by discussing with TRITEC partners their technology strategies and needs. Such discussions would lead to a structured *technology request* [25] that would become the basis for seeking and qualifying suitable technology providers, interested in embarking on a corporate venturing alliance. During the first months of the project about 40 companies agreed to collaborate; these companies ranged from multi-billion euros multi-industry multinationals to smaller, single product local firms, with turnover of a few tens of million of euros.

Simultaneously with the creation of this group of large firms, TRITEC partners identified and invited about 20 VC firms to collaborate with the project by agreeing to consider minority investments in trilateral alliances. These firms provided background information on their investment criteria and other characteristics, such as current portfolios, size of operations, etc. in order to help with selection of the prospective VC partner for each alliance.

2.3 Identifying and qualifying SME's

In order to identify and select technology SMEs with potential solutions and/or competences matching the identified technology needs of larger companies and who are willing to share the business ideas of the larger companies, a sequence of actions was carried out by TRITEC partners. Table 1 shows that sequence.

Table 1 – Identifying potential technology partners of the CV alliances

Initiating a Technology Request	A larger company submits a technology request to a TRITEC partner indicating desired attributes for the new technology and the type of co-operation sought.
Distributing the Tech Request	
<i>Networks</i>	TRITEC partners activate their regional networks (business support bodies, universities, R&D organisations, etc.) in order to identify SMEs having potentially matching capabilities.
<i>Web Site</i>	The Technology Request is posted at TRITEC website so additional potential SME partners may become acquainted with the technology request
Qualifying the Tech Offer	
<i>Initial contact</i>	Respondents to technology requests are prequalified by briefing them on the objectives, basic requirements and procedures of the project and on what is expected from the technology provider.
<i>Diagnostic Briefing</i>	A TRITEC partner visits suitable, prequalified SME respondents that match the basic principles of the project and conduct a preliminary diagnosis in order to more fully ascertain the potential of the prospective technology provider.

Technology offer

Where the diagnosis shows a suitable match, a detailed technology offer is prepared and submitted to the larger firm for its consideration..

During the execution of TRITEC project 37 technology requests from 28 industrial collaborators were prepared and more than 45 technology offers were screened. At the end of 2004 negotiations were underway concerning 6 potential alliances and, in one case, such negotiations had already been successfully concluded.

2.4 Assisting SME's in dealing with larger firms

Typically, a trilateral alliance would commence with bilateral negotiations between the larger firm and the technology SME. In these negotiations SMEs are the most vulnerable party due to the differences in experience and scale of the resources deployed by the two parties [26]. The demands on the limited resources of SMEs can be high whereas for larger corporations a wide range of skills, that can appear intimidating for the SME, may be deployed with a relatively much lower cost. Thus, SMEs are often at risk (real or perceived) of being taken advantage of by large potential alliance partners during both the negotiation stage and any subsequent alliance. A number of situations, such as an early exit by the large firm, an under-investment on the relationship, and the placement of unreasonable demands all damage the value making potential of the SME [27].

The difference in the rate at which large companies and SMEs are able to absorb their respective benefits from alliances between them is the main reason why, in general the greater part of the value created in the alliance is captured by the large company. Large company are generally more able to learn about SMEs' technology at higher rate than SMEs are able to learn about and use the wider organisational resources and capabilities of corporate partners. So, often the large company is able to realize the full potential of the new technology and the SME is unable to grow even if the technology has significant market potential [28]. On one hand, the resources sought by SMEs are frequently very complex as large companies' capabilities usually have been developed over many years, and are dispersed throughout the organisational units. On the other hand, SMEs' technology is often embodied in products or processes that are more easily understood by the larger firm and incorporated in their organisational settings [29]. In some cases the difference in the pace of learning translates into a learning race, where the winner tends to be the larger corporation [30].

Matters of cultural and size differences can also become major obstacles to forging alliances [26]. Size differences in organisational contexts are seen as more difficult to overcome than national culture clashes [31]. Large company culture usually rewards people for doing things correctly within the limits given for their activity, while frequently SMEs' rapid and "outside the box" thinking is the most rewarded line of action [32]. This cultural clash is potentially one important source of conflict and the reason for many bottlenecks along the implementation phase of the alliances.

The TRITEC project addressed the above and other risks that might impair SME interests or introduce threats in the alliance by developing a number of guidelines and protocols designed to help SMEs in the negotiation and execution phases of the alliances and by providing assistance from the pre-alliance stage through to the settlement of the final agreement. This nurturing process was carried out in direct support of the SMEs, assisting them to assess and address real or perceived issues of concern. In the following

paragraphs some of the issues and risks that may arise during the negotiation between SMEs and larger companies are discussed.

Before starting the negotiations with the larger companies SMEs were coached by TRITEC partners on how to identify the capabilities (technical, organisational, managerial, etc.) they were in need of and to define their strategic interest on the proposed alliances. Making explicit what SMEs really wanted from alliances and gauging the adequateness and compatibility of the larger partners to fill SMEs' capability gaps before starting negotiations is a good method for SMEs to avoid placing themselves in a fragile position in the negotiation phase [32].

So, SMEs were encouraged to perform their own investigations to protect them from potential harmful behaviour of corporations. More specifically, they were urged to observe whether the strategic objective of corporations were congruent with their own objectives and whether potential larger partners had the motivation and disposition to deliver the resources needed for the partnerships [33]. One important consideration for SMEs when considering a potential alliance is the previous alliance experience of their potential larger partners, in order to determine as much as possible the corporations' real intentions on the deals [34].

Besides new technology, SMEs can bring other resources to alliances, which can reduce the learning process for the large companies. The most effective additional resource is the ability to provide a continuous flow of new or refined technologies to the alliance. So, whenever possible SMEs should try to diversify their investments in related technologies or support an enabling or platform technology capable of spawning a family of products instead of focusing solely on one technology [28]. The alliance agreements should allow for these contributions by SMEs and establish clearly how such contributions should be valued.

An essential first step at the negotiation table is building trust among the potential partners and thus reducing potentially threatening actions for the SMEs [28]. TRITEC partners encouraged an open and honest relationship between prospective partners. This trust creation was the basis for the design of a solid interface between alliance partners to foster commitment and communication, and to develop shared understanding.

Evidence suggests that poor communication between potential alliance partners is a frequent cause for the failure of CV alliances [35] and that the involvement and commitment of senior executives and managers of the larger corporation during negotiations is the main factor for the successful implementation of any strategic alliance. Senior level commitment in the larger company helps to create acceptance across the entire organisation [36]. Thus, when negotiating with larger partners it is essential to build connections to key executives of the large besides the more obvious need of having the commitment of the middle management for the effective implementation of the alliance at operational level.

2.5 Guidelines, protocols and templates

The terms under which trilateral alliances were prepared and negotiated were guided by a number of documents, protocols, templates and procedures, so that barriers to effective implementation of the alliances were more easily overcome and potential conflicts were avoided [26]. Some issues that were addressed by these documents are discussed in the following paragraphs.

Since the beginning of the negotiations efforts were made to have a clear definition and mutual understanding of the alliance partners' roles and responsibilities. This requirement was considered essential to prevent any future misunderstandings or fears of loss of control. These clarifications were also viewed as an indispensable part of a good implementation plan [37].

Negotiated contractual arrangements clearly stated how the large firm will apply the technology, how income (e.g. sales revenues, royalties, etc.) will be allocated, and how the knowledge transference will be made between the partners.

Some clauses were introduced in the contracts in order to protect SMEs' interests from opportunistic actions of larger partners (e.g. to avoid information leakage).

Many of the large companies' investments are made in the form of in-kind contributions, e.g. the use of a large company's laboratory by an SME, the lending of computers to the SME, or the training of an SME's human resources by a large company. These contributions create and increase the risk of dependence in the alliance relationship as the cost of replacement (switching costs) by those of third party suppliers can be prohibitive [38].

Valuing the investment made at the time when the VC firm may wish to realise its capital gains.

Other matters covered by the guidance documents are listed on Table 2.

Table 2 – Other guidance documents

Deal Outline	A template to be used by the larger company to propose a broad outline of a potential deal to the preferred SME partner after conducting appropriate due diligences, when applicable.
Action plan	This document accompanies the Deal Outline and identifies key areas requiring assistance and/or improvement.
Deal execution	The key contracts for the deal execution include a shareholder agreement, a funding agreement and a management services agreement.
Management assistance	Depending upon the nature of the action plan, the large company may participate in the management of the SME and may provide coaching and mentoring services as well as services.

Corrective action plan	If the goals of the action plan are not met or major departures from the company's business plan occur, a corrective action plan is initiated.
Exit	At a time that is appropriate for the SME, an exit plan will be initiated. The exit mechanism and process will be developed jointly and in accordance with the shareholder agreement.

2.6 A VC firm to complete the trilateral alliance

Usually during the negotiation phase or immediately thereafter, the third partner, a VC firm, may join the alliance. This will occur typically after the SME and larger firm have agreed on a joint strategy and on a (at least) preliminary alliance contract. So, if they find that a third party is a necessary requirement (e.g. financial resources from the large firm are insufficient) or just a desired addition (e.g. that it takes a share of the risk of the operation), TRITEC partners are able to introduce them to one or more suitable and interested VC firms. These would tend to be drawn from a network of VC firms set up as part of the TRITEC project, among VC firms deemed to be appropriate potential partners in accordance with their investment strategies, industry focus, past experience and reputation.

3 Implementing a Trilateral Alliance: The WATTECO Case

The WATTECO case represents a successful alliance between a large company, Schneider Electric, a technology based SME, CTI - Conseil en Technologies Innovantes (*consultancy on innovative technologies*), and a VC firm, Schneider Electric Ventures (SEV) to develop and market an innovative electronic system [39] able to meter simultaneously the electricity consumption of all appliances in a household, an office, a shop or a factory without the need to laboriously add wattmeters onto every appliance whose consumption is to be measured. Appendix 1 (Watteco Partners) provides more detailed information on the partners of this alliance.

The context that favoured the realisation of the WATTECO alliance stems from recent developments of the EU electricity market, which was to be totally liberalised by the end of 2004. This regulatory change prompted strategic reactions from electricity suppliers as they tried to obtain advantages over their direct competitors and to protect themselves from the increased competitive environment. So, many companies in the electricity distribution business started to search for innovations especially in customer services and energy economy areas that could help them protect or advance their market share.

The management of Schneider (a major equipment supplier to electricity distribution companies) considered the TRITEC project to be a plausible and trustworthy initiative that might help them to realise new innovations. As a result, a Technology Request (TR) was placed by the company in order to identify possible providers of innovative technologies related to metering and communication systems, as well as to new services within the electrical distribution market. Schneider was particularly interested in systems that could provide information about customer behaviour, either in domestic or

commercial applications, so as to improve the features of their range of products. Schneider's TR was submitted in November 2003.

CTI is a French start-up (incorporated in 1998) initiated by engineers specialised in the signal processing technologies in the aeronautical and naval industries, especially in the processing of sonar signals. The company has research capabilities in the microelectronics industry and has been active in providing technology services to other French companies in the signal processing, sensors and acoustics areas.

CTI was a member of the network relations of the TRITEC French partner – Toulon Var Technologies – TVT (F) [22] – as this organisation had supported actively some research projects carried out by CTI in the past. So TVT (F) was aware that CTI was developing a new technology that could provide metering of energy consumption of individual electrical appliance attached to a network. TVT (F) recognised easily that the technology was attractive and fitted perfectly the Technology Request made by Schneider.

TVT (F) prepared an overview of market developments and of Schneider technology strategy in the last ten years, specifically focusing the external growth of the company and the domains in which Schneider carried out investments, acquired new technologies and developed new capabilities. This information helped to clarify the strategic intentions of the corporation and to identify possible hidden agendas that could impair the alliance. As both CTI and TVT (F) were satisfied with the results of this analysis, CTI decided to go ahead and negotiations between the potential partners began.

Since the beginning Schneider preferred that a VC firm should be part of the alliance, as this was the usual approach of this corporation when investing in new start-ups. This way the involvement on the financial issue would not be a burden carried by Schneider solely but shared with a VC firm, which would be more experienced in the field. So, Schneider Electric Ventures (SEV) was contacted and become a partner of the project. Another VC firm was included in the process, the French Financière Saint Servan, which acted as a consultant to CTI in its negotiations with Schneider.

From the outset TVT (F) provided key advice to CTI aiming at preparing the small technology firm for the negotiation rounds with Schneider and SEV. Some of the recommendations TVT (F) provided CTI with were:

- Separating management and R&D teams: CTI should strive for a clear separation of the managements of CTI and Schneider, so that the CTI's culture (a typical 'outside the box' mind set) would not be affected by the more formalised culture of Schneider. With this separation any potential conflicts deriving from cultural differences could be avoided and the implementation of the project would be less likely to suffer constraints. In addition, a clear division between Schneider and CTI staff roles during the development and the commercialisation phases would reassure CTI as regards its concerns of information disclosure to Schneider. Schneider teams would work on developing new systems for processing the signal produced by the WATTECO device and, on a second stage, in the marketing and distributing the products thought the channels for which the agreement is valid.

- Protecting the intellectual property and the R&D results: it was agreed that such property would remain with CTI and should not be transferred to Schneider, as it would create an imbalance in the amount of knowledge relevant to the partnership in favour of Schneider thus impairing the autonomy of CTI; following this recommendation, a business lawyer with IP experience was involved in the negotiations.
- Commercialisation rights: besides the concerns on losing the proprietary rights on the results of industrial development of the product CTI wanted to protect also its marketing rights. Granting exclusive commercialisation rights to Schneider could severely threaten the real ownership of the technology so, the final agreement did not include any exclusive rights to Schneider for marketing and distributing the new products.

A new company – Watteco – was incorporated as a result of the negotiations. SEV acquired a 33 percent interest in the company by investing €650,000. The owners of CTI kept a controlling stake (67 percent) of the firm. Schneider Electric will provide an ‘in kind’ contribution, consisting basically of R&D support and the preparation and implementation of a marketing and distribution strategy.

The alliance agreement covers an initial period of 3 years, providing both SEV and the owners of CTI with the option to sell their participation to a third party after such period is elapsed.

The licensing agreement among the partners opens the possibility of WATTECO commercialising its technology in other applications in the energy industry.

Thus, CTI is able to put in practice its technology benefiting from financial, technical and marketing support from the other two partners. Schneider obtains an industrial license for a specific use of a new technology and refrains from becoming involved in additional uses of the technology (without the prior consent of CTI/WATTECO), and SEV invests in a very solid opportunity of capital gains.

The business plan of WATTECO foresees annual sales of about 5,000 systems worth € 10 million (a few hundred thousands in 2004) and a staff increase to 20 persons (7 people in 2004) in a 3-year period.

Both Schneider and CTI agreed on developing joint R&D efforts for future systems based on the WATTECO technology: Schneider’s R&D facilities will be placed at WATTECO’s disposal and the intellectual rights arising from the research will be shared between the two parties.

4 Lessons

The TRITEC project has shown that larger companies or for that matter companies of any size exhibit a general inability to be able to identify and articulate information on technology needs that might contribute to realisation of their business strategy – at least in cases where the solution to their requirements cannot be straightforwardly defined in technology specific terms.

Incremental innovation and the technology development or refinement that tends to support it can and is dealt with, with relative ease. Incremental change may be defined in precise detail and the source of the solution is usually to be found within the existing value chain. Such technology development or refinement is usually best dealt with through normal commercial channels, such as purchasing (off the shelf technology) or licensing technology that might need some ‘extrapolation’ to fit a particular need.

TRITEC, on the other hand is predicated upon being able to assist (larger) companies to reach beyond their existing value chain and wider ‘comfort zone’ to ‘cross boundaries’ – geographic, sector, application and technology wise, in order to explore hitherto unknown sources of potentially discontinuous innovation that may offer the opportunity for radical change. The case of WATTECO illustrates this and the value of engaging intelligent intermediaries to assist this process. Often, in such cases it will be necessary to define interests and needs in ways that may be easily translated and used by (sometimes) non-specialists in order to define and initiate searches via wide ranging networks across several countries. TRITEC has made useful progress and developed a process of stimulating, managing and capturing information about needs that is helpful to this end. However, so critical is this process in enabling any ‘market pull’ based initiative to function properly that the TRITEC partners believe that this is an area in which further research would be helpful.

One of the early findings of TRITEC project was that the trilateral approach is appealing to the venture capital industry. All of the VC firms contacted and introduced to TRITEC project showed interest in actively participating in the initiative and were willing to consider setting up trilateral agreements.

The WATTECO case demonstrates the value of the role that can be played by a knowledgeable intermediary in the process of establishing a fruitful alliance. So, in establishing WATTECO the matching process between the larger firm and the technology SME was facilitated by the in-depth knowledge that TVT (F), the French member of the intermediary consortium (TRITEC), had of the community of technology SMEs in its region. So, the involvement of an independent third party able to activate relevant sources of technologies was a key factor for making WATTECO alliance possible. Besides operating the matching process, the intermediary qualified the technology and the competences of the smaller firm thus easing its introduction to the larger firm. Additionally, during the preparation and execution of the negotiation process, the intermediary provided additional facilitating roles acting as an independent adviser to the SME. This role is very important to obtain a balanced agreement, as usually the smaller firm lacks the knowledge and experience of negotiating an alliance (probably the first time the SME is faced with the situation) with a larger firm (which probably had

already conducted various similar negotiations and can call on a range of specialist resources).

During the negotiations CTI (the technology SME) introduced the possibility of future technology developments to become part of the collaboration agreement. Provisions agreed upon in this particular aspect create the possibility of having a continuous flow of technologies that may result in new and expanded future partnerships. As noted by previous research [28], the prospect of having a continuous flow of technology developments embedded in the main collaboration agreement in such a way that the large company partner has a preferential treatment (e.g. the right of first refusal) is one of the most effective and reassuring ways through which SMEs attain a higher level of commitment from large companies.

Another finding of this research was that the participation of the larger firm might ease the agreement on an exit strategy for the VC firm by increasing the available options. The larger firm is in a good position to agree on buying out the participation of the VC firm at maturity. Also, as the larger company's intervention in the development and exploitation phases provides a reasonable assurance of the success the risk of investment is reduced for the VC and a better estimate may be made of the eventual value of the investment on the basis of an anticipated future negotiated trade sale.

The general findings of TRITEC are that there remains a huge latent demand for new (discontinuous and even disruptive) innovation that in large part will be enabled through sourcing and absorbing new and different technologies from sources beyond existing value chains. To do this there is a growing need for 'intelligent' intermediaries who can assist in 'translating' needs in terms that are transferable and comprehensible across sector, application and technological boundaries. The greater divergence from current practice, the greater is the need the dependence upon third party sources to provide, develop and assist implementation of the technology.

New technologies are increasingly the preserve of SMEs, often early stage businesses, keen to secure an outlet for and financial return on their technology. This mutual and complementary dependency fuels the need for strategic alliances of one kind or another between the two parties. For major corporations, the cash required to fund the alliance may be forthcoming from existing or specially established budgets or, increasingly from fully funded but independent venture arms of the companies.

However, in the case of mature 'mid cap' companies the need to partner with the technology source (as opposed to going it alone) is even more pressing while, at the same time such companies are invariably low on cash assets and thus unable to fund the venture. This is where there remains a huge latent 'market' for venture capital firms to engage in trilateral alliances – to provide the missing 'cash' element that will deliver the fruits of collaboration between the other two companies (and at reduced risk and dependence upon due diligence).

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- [25] A specific template was developed for collecting and processing the information pertaining to the technology requests placed by large firms within the TRITEC project. This template, besides identifying the technology area of interest, describing the existing technology which was supposed to be replaced by the new one (when applicable), listing the properties sought for the new technology, and specifying any desired key technical requirements, described the type of collaboration mechanisms preferred by the large firm (licence agreement, technical co-operation, joint venture agreement, manufacturing agreement, type of investment the large firm was willing to consider, including providing support to partner in cash or in kind and acquiring an equity stake in the SME, exclusivity and confidentiality requirements), and the desired profile and role for the SME. In addition, the template included guidance to direct TRITEC partners on the search of suitable SME's by identifying technologies already considered and their limitations, possible sources of technology already approached without success, potential other useful technologies, applications and partners. The document was structured in 3 parts: (1) the first section was an abstract of the request appropriated to be widely disseminated, (2) the second section was intended for selective distribution to chosen networks in order to qualify the match and its interest, (3) the third section provided TRITEC managing partners information needed to formulate their search strategy and to deal with confidentiality matters, if necessary.

The first 2 sections of all TRITEC technology requests were signed off by the originator larger firm as not containing confidential information.

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Appendices

1) Wateco Partners

1.a) SME: CTI – Conseil en Technologies Innovantes

"CTI - Conseil en Technologies Innovantes" (consultancy on innovative technologies) is a start-up SME providing technology services in the fields of signal processing, sensors and acoustics. Incorporated in 1998, it is located in "La Valette-du-Var" in the South of France, has a turnover of a few hundred thousand Euros and employs 7 people (1st quarter 2004).

CTI has contributed to a number of CRAFT projects such as 'Ripencheese' (innovative device for controlling the cheese ripening process) and 'Cereal' to detect the insect *Ceuthorrhynchus assimilis* (a pest endangering a number of crops) by acoustic methods.

The company has substantial expertise in electromagnetism measurement and control and has filed a patent concerning a new electricity analysis system ("TEPAC - Transitory Electromagnetic Pulse Analysis & Correlation"), which is the base technology for the Wateco alliance.

1.b) Large Firm: Schneider Electric

Schneider Electric is one of the world largest companies in electrical distribution and automation and control. The company is present in 130 countries in all the continents of the world, and is listed in the Paris CAC stock market.

Founded in 1836, as "Schneider & Cie" an armaments specialist, nowadays the Schneider group generates €8.78bn in sales revenues and employs over 74,000 people (2003). 55% of its sales revenues are originated in Europe, 25% in North America, and 20% in the rest of the world.

The Schneider group is active in four business areas: *Energy & Infrastructure* (speed variators for escalators, medium-voltage cells for supplying subway trains with electricity, etc.), *Industry* (detectors, emergency stopping systems and communication systems), *Buildings* (lighting systems, network power points, fire detectors), and *Residential* (switches, circuit breakers, automatic blind controls)

Schneider Electric holds three global brands: *Merlin Gerin* (electrical distribution), *Telemécanique* (automation and control) and *Square D* (operating in both core

businesses). The group also owns strong local brands and specialist brands recognised as leaders in their fields.

French investors account for 53.51% of Schneider shareholdings, coming foreign investors second with 34.70% of the stock. Other minor owners are “Caisse des Dépôts et Consignations” (4.34%), the company’s employees (3.62%) and intragroup cross shareholdings (3.83%).

Schneider is always looking for innovative ideas that may help the company to develop new customer’ services, either in the household or in the service/industry segments. Bearing in mind the programme for liberalising the European electricity market by the end of 2004, the company is looking for new metering devices, communication systems and services that may provide it with a technology edging relative to its competitors, especially in the areas of customers’ services and energy economy.

1.c) Venture Capital: Schneider Venture

Schneider Electric Ventures is a venture capital firm incorporated in 2000, located in Paris (France), and managing a 50 M€capital fund. The company invests annually 0.5 to 3 millions Euros in growth companies focused on emerging and innovative technologies in Industry, Energy and Building Markets.

Schneider Electric Ventures target focus is on the following fields:

- Communication, Micro-generation of electricity and Sensors,
- MEMS, Nanotechnologies and Opto-electronics,
- New Services and Networking applications in Building automation, Energy monitoring and Industry.

2) Wateco Technology

WATTECO is a new technology allowing measuring and analysing with a single measuring apparatus the electrical consumption of any electrical device plugged on a network.

The technology is based on the experimentally tested fact that during the switching-on or the switching-off of an electric device (e.g.: an oven, a TV set, a light bulb) a high and very short current impulse is emitted into the network to which the device is attached. This electromagnetic impulse is in general specific to the originating device, thus constituting a kind of electromagnetic signature of the apparatus.

So, it is possible to know, by recognising its electromagnetic signature, which device has just been switched-on (or switched-off) in an electric network. Concurrently to this system of signature recognition, if the incremental power that is delivered by the network

when the device is switched-on is measured (with a wattmeter), the power consumed can be allocated to the particular device that has been switched on. Since the electromagnetic generated impulses circulate through the entire network, the signature recognition system can be inserted at any plug of any branch of the network, making the type of measurement quite easy and convenient.

Thus WATTECO is a simple, non-intrusive technology, which does not require any modification of the electrical network. Thus its installation on a commercial or a residential building is easy (can be done by an user or an electrician), does not require any license, and, as the system is very discreet, does not conflicts with the surrounding visual environment neither requires any changes of the users' habits.

The WATTECO system is obviously much more cost effective that previously used systems, which required a large number of apparatus attached to the various devices to be measured.

Once linked to a computer, the WATTECO system can provide a number of useful indicators for each electric device attached to an electric network of a building (commercial, industrial or residential), such as its the electric power and consumption (the later in physical or money units), as well as information concerning the electrical performance of the entire network (total consumption, breakdown of the consumption by appliance, daily, weekly, monthly and yearly consumption averages, etc.).