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Investor Acceptance of Wind Energy in Switzerland

Auftraggeber:
Bundesamt für Energie BFE
Forschungsprogramm Windenergie
CH-3003 Bern
www.bfe.admin.ch

Auftragnehmer:
EPFL CDM CSI
Station 5
CH-1015 Lausanne
http://csi.epfl.ch/

Autoren:
Bürer, Mary Jean, EPFL, maryjean.burer@epfl.ch

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BFE-Bereichsleiter: Katja Maus
BFE-Programmleiter: Robert Horbaty
BFE-Vertrags- und Projektnummer: 153055 / 102429

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Executive Summary

Wind power is undergoing rapid growth world-wide (capacity grew by 28% in 2007 and 29% in 2008). This growth is partly stimulated by the numerous government support mechanisms, including feed-in tariffs for renewable electricity. Announcements of new wind power developments in Switzerland are now increasing more than ever before, and this increase in interest does seem to be linked (simply due to the timing) to the introduction of a feed-in tariff in Switzerland.

To understand how policy plays a role in stimulating investor acceptance of wind power (a part of social acceptance[1]), we interviewed a number of developers and investors investing in wind power (most of which have already invested or have plans to develop or invest in a wind power project in Switzerland). Therefore, this study covers the views of 17 developers and investors in Switzerland which were collected during two sets of interviews – one in the fall of 2008 with 13 developers and investors and one in the first half of 2009 with 15 developers and investors. 11 of the investors and developers interviewed initially in 2008 also participated in 2009.

This report is therefore not the opinion of specialists such as Suisse Eole or the opinion of the Swiss Federal Office of Energy (SFOE), but rather a compilation and synthesis of the remarks made by several industry practitioners that we interviewed for this study. Therefore, this report covers opinions, not facts. Yet, assuming industry perceptions mirror industry reality and are a good way to assess at least the current market situation, this method provides key insight into today's market conditions, the current set of policies' impact on renewable energy investment today, and possible interactions. We examine, in particular, their views on the newly introduced Swiss Feed-in Tariff (FiT)[2].

The wind power developers and investors that we interviewed also provided feed-back on how they are affected by not only the FiT law, but the cantonal permitting process, the level of social acceptance for wind power in Switzerland, the financial crisis, and how these issues relate to each other and affect their business, and further investor acceptance, in Switzerland. We draw a picture of the wind power industry at this point in time using the findings gathered in this study. The picture is one of a potentially important new industry for Switzerland just beyond infancy, and it could be worth updating this picture as the industry evolves over the next several years.

Through this study, we gain a better understanding about why developers and investors invest in wind power today, key barriers they perceive in the Swiss wind power market, how things in Switzerland compare to other countries, how the new Swiss feed-in tariff affects their decision to invest in wind power, what could be improved in the regulations (federal and cantonal) in their view, and how they see the financial crisis affecting the wind power business in particular. Perhaps these findings can be particularly useful if and when the government reviews progress to date, and considers revising the FiT policy in Switzerland.

[1] Investor acceptance is a particular form of social acceptance, as described in *Energy Policy*: "Social acceptance of renewable energy innovation: An introduction to the concept", Volume (Year): 35 (2007), Issue (Month): 5 (May).

[2] A Feed-in Tariff is an incentive structure to encourage the adoption of renewable energy through government legislation. The Swiss system, like those in Germany, France and Spain, pays a renewable energy generator for every kWh of electricity generated.

A few of the major findings from this report are summarized as follows:

- Almost all interviewees emphasized the need to reduce the regulatory or administrative burden related to obtaining the construction permit – procedures which are different for each canton.
- While investor acceptance was an issue for certain firms given the reduced feed-in tariff, we also learned that financing was not the key problem for most of the developers we interviewed (although one should note that we did interview many developers linked to private and public utilities which have their own sources of finance).
- The key problem perceived was the risk of resistance to wind power projects by environmental groups and for some it was the risk of being unable to receive the building permit in time to officially receive the feed-in tariff.
- Local politics was highlighted by every firm interviewed as being an element that very much affects the success of projects in Switzerland. Local utilities or firms with good strategies to obtain local acceptance (e.g. those having local shareholders) are probably most likely to succeed. Otherwise, the basic strategy towards increasing social acceptance was good communication with stakeholders. As one person put it: “explain, explain, explain”.
- We have seen from this study that in Switzerland investor acceptance generally follows local and social acceptance. Furthermore, many developers will undertake at least some projects regardless of less than advantageous return rates, because they do it for other reasons (attracting new customers, etc.).
- However, investor acceptance could be improved with a higher FiT level, covering the real costs of development for the majority of potential wind power projects in Switzerland.
- Furthermore, investor acceptance increasingly poses a problem for certain investors now that there is an economic crisis, and the FiT is not necessarily covering all costs.
- The findings appear to support the notion that a large portion of the proposed projects (applying for the FiT) - perhaps half - are likely to die and especially smaller independent developers will experience uncompleted project plans because of financial reasons, and this is due to mainly higher costs of developments in Switzerland compared to other countries and the risks in the permitting process.
- If the goal is rapid market development, then the FiT should be increased and the cap on the FiT system should be eliminated. Investor acceptance would be improved, however it is not clear that the level of social acceptance in the country would be improved with a higher FiT.
- It is important to understand, however, that there is a natural cap on the proliferation of wind power projects already. This natural cap comes from the people themselves. Indeed, they have already been active in determining the limit for wind power growth in Switzerland, as we remain with a very decentralized and democratic process in which every person can oppose a given project. Indeed, as this is the case, the government-imposed cap on the system is probably not helpful, as some interviewees believe.
- In short, our basic recommendation for policy-makers in Switzerland is to at least correct for the VAT inclusion in the FiT level, and promote the use of cantonal plans for determining where wind power developments could be located.
- If possible, the cap on the FiT should be eliminated and the FiT level increased to 23 cents (or even a higher level if politically acceptable) until the market is well established and then the tariff can be decreased.

Finally, this is a study that provides a picture of an industry at a certain point in time – in a way this report serves to document the emergence of the wind power industry in Switzerland. By interviewing wind power developers and investors at two periods of time since the announcement and introduction of the new Swiss Feed-in Tariff, what the reader of this report is also witnessing is the change of developments and the change of mind-sets in this emerging industry.

Sommaire Exécutive

"L'acceptation de l'énergie éoliennes en Suisse : Investir ou ne pas investir"

Aux quatre coins de la planète, l'énergie éolienne a le vent en poupe. La capacité du parc éolien mondial s'est accrue de 28% en 2007 et de 29% en 2008. En Suisse, l'énergie éolienne dispose également d'un potentiel significatif, puisque d'ici 2030, quelques 600 GWh de courant pourraient être produits annuellement par des installations conformes aux exigences strictes du Concept d'énergie éolienne pour la Suisse. De nouveaux développements éoliens sont désormais souvent annoncés dans la presse. Cette embellie de l'énergie éolienne est partiellement stimulée par les nombreux mécanismes gouvernementaux, et semble essentiellement liée à l'introduction de la rétribution au prix coûtant.

Pour comprendre comment la politique énergétique peut jouer un rôle dans la stimulation des investissements dans l'énergie éolienne en Suisse et notamment par rapport à la question de l'acceptation sociale[3], une investigation auprès de plusieurs développeurs et investisseurs (17 entreprises privées) pour sonder leurs avis respectifs sur une ensemble de problématiques soulevées. La plupart des sondés sont membres d'entreprises Suisses qui font d'ores et déjà des investissements dans des projets du l'énergie éolienne en Suisse.

Les interviews menés on été organisés en deux partie. 13 entreprises privées ont tout d'abord été sondées en Automne 2008. 11 de ces entreprises et 4 autres ont ensuite été sondées en hiver 2008 et au printemps 2009.

Les résultats de cette enquête sont présentés dans ce rapport. Ils ne sont pas le reflet de l'avis de spécialistes tels que ceux de l'organisation Eole ni ne présentent l'opinion de l'OFEN. Ils sont une compilation et synthèse des opinions émises par les praticiens interrogés (et non pas nécessairement des faits objectifs).

L'accent a notamment été mis sur la collecte des opinions des investisseurs et développeurs éoliens à propos de la nouvelle rétribution au prix coûtant. Les interlocuteurs ont également évoqués les problèmes divers liés aux autorisations nécessaires pour l'emplacement des projets en Suisse (ces autorisations sont délivrées par les cantons), ainsi qu'aux aspects relatifs à l'acceptation sociale, la crise financière mondiale et à leur impact sur le développement de l'énergie éolienne en Suisse. Ce secteur est en forte évolution et une étude similaire sera peut être à nouveau conduite dans quelques années.

Les résultats majeurs de cette étude sont les suivants:

- Presque toutes les sondés ont souligné l'importance primordiale des politiques locales pour le succès du développement de leurs projets éoliens. Les producteurs d'électricité ou les entreprises ayant mis l'accent sur des campagnes de communication efficaces auprès des parties prenantes (' expliquer, expliquer et encore expliquer' selon les mots propres d'un sondé) pour gagner le support local pour leurs projets sont probablement à l'origine des projets réussis.
- Le manque d'acceptation sociale sous la forme d'une résistance exprimée par le public ou par certaines organisations écologiques est une problématique jugée essentielle par certains interlocuteurs. Pour d'autre le problème clé se situe dans le risque de ne pas obtenir le permis de construire dans les temps pour bénéficier de la rétribution au prix coûtant. Les interlocuteurs dans leur ensemble se sont du reste prononcés avec force en faveur d'une simplification et d'une harmonisation des

[3] Voir *Energy Policy*: "Social acceptance of renewable energy innovation: An introduction to the concept", Volume (Year): 35 (2007), Issue (Month): 5 (May).

procédures d'obtention de permis de construire. Les procédures sont différentes dans presque tous les Cantons.

- Les aspects de financement ne sont pas jugés essentiels pour la plupart des développeurs interrogés, même si la diminution progressive de la rétribution au prix coûtant est un problème souvent évoqué. La décision d'investissement a ainsi été évoquée comme subordonnée à la question de l'acceptation sociale. Ainsi, certains sondés ont estimés qu'ils pouvaient aller de l'avant même dans des conditions financières peu favorables dans la mesure ou les projets étaient soutenus par l'opinion publique, au service de leur image de marque. Il faut néanmoins que les développeurs interrogés sont liés à des producteurs d'électricité disposant de ressources financières propres.
- Cependant, les critères de financement prennent davantage d'importance dans le contexte de la crise financière et parce que le niveau décidé de la rétribution au prix coûtant ne couvre en réalité pas tout les coûts de développement.
- Le contexte d'investissement serait amélioré avec une rétribution au prix coûtant à un niveau plus élevé que le niveau existant, de manière à couvrir les coûts réels du développement des projets éoliens en Suisse.
- Une grande part des projets candidats à la rétribution au prix coûtant – peut-être la moitié – sont ainsi probablement appelés à péricliter, plus particulièrement les projets menés par des développeurs indépendants avec pour principales causes des coûts plus élevés en Suisse en comparaison avec les autres pays et les risques liés aux longues et difficiles procédures pour l'obtention d'un permis de construire.
- Si l'objectif avoué est un développement rapide du marché éolien en Suisse, alors selon les sondés la rétribution au prix coûtant doit être augmentée et la limite imposée aux fonds publics accessibles pour mécanisme doit être levée. Cela permettra un contexte d'investissement plus équilibré avec les autres pays Européens.
- Cependant, les problématiques d'acceptation sociale demeureraient. Selon certains interlocuteurs, il est important de comprendre qu'il y a ainsi une limite naturelle du potentiel de prolifération de projets éoliens en Suisse, i.e. la démocratie directe de laquelle découle la détermination de la prolifération acceptable des projets éoliens en Suisse. Des limitations politiques additionnelles ne sont donc selon eux pas justifiées.
- En résumé, les recommandations de ce rapport sur la base des interviews menés est au minimum de corriger l'inclusion de la TVA dans le mécanisme de rétribution au prix coûtant, ainsi que de promouvoir l'utilisation des plans cantonaux pour l'énergie pour la détermination des sites optimaux pour les projets éoliens. Si possible, la limite de fonds attribués à la rétribution au prix coûtant devrait être éliminée et le niveau de rétribution augmenté à au moins 23 centimes jusqu'à l'établissement durable du marché pour ensuite être éventuellement réduit.

Cette étude reflète l'état du secteur éolien en 2008 et 2009. Elle documente l'émergence de ce marché en Suisse et l'évolution des opinions sur la base des témoignages recueillis auprès des mêmes acteurs du secteur à deux reprises en l'espace de six à douze mois.

1. Current Situation

It is important to begin with an overview of regulatory events that happened until the start of our journey through this emerging industry. Policy will probably have a role to play for some time, notably because of the traditional political nature of the energy sector and the presence of externalities that make it challenging for renewable energy technologies to compete on equal terms with incumbent conventional forms of energy. The reader will most likely infer from this study that what happened in the past and in recent times in the regulatory world in Switzerland has quite an impact on how this industry will emerge in the future. Wind power installations in Switzerland have grown at a very slow rate until now. It appears that with the new feed-in tariff for renewable energy this rate of growth will increase.[4]

To start with, on 23 March 2007, Parliament revised the Swiss Federal Energy Act at the same time as it adopted the Swiss Federal Electricity Supply Act. The revised Energy Act stipulates that the production of electricity from renewable energy sources must be increased by at least 5,400 GWh by 2030. It also contains a package of measures for promoting renewable energy and efficient electricity use. Here the most significant measure concerns cost-covering remuneration for the input into the network of electricity produced from renewable energy sources. The sum of around 247 million Swiss francs per annum will be available for offsetting the difference between remuneration and market price.

This form of remuneration is to apply to the following technologies: hydropower (up to 10 megawatts), photovoltaics, wind energy, geothermal energy, biomass and waste material from biomass. The tariffs for remuneration for electricity from renewable energy sources (green power) have been specified on the basis of reference facilities for each technology and output category. Remuneration will be applicable for a period of between 20 and 25 years, depending on the technology. A gradual downward curve is foreseen for these tariffs in view of the anticipated technological progress and the fact that it will be possible to bring more and more of these technologies onto the market. These reductions will only apply to registered production facilities, which will then receive remuneration on the basis of a constant tariff throughout the entire period of remuneration.

Producers who decide in favour of the cost-covering remuneration option cannot simultaneously sell their green power on the free ecological electricity market.

The provisions governing cost-covering remuneration are laid down in the amended Swiss Federal Energy Ordinance and will enter into effect on 1 January 2009. Facilities that were put into operation prior to 1 January 2006 can benefit from this form of remuneration, and their operators can register these facilities with Swissgrid (the national network operator).[5]

The implications of the level that was set for the Swiss Feed-in Tariff is, for example, is one of the key topics covered in this report. For example, some developers and investors we interviewed believed that the rate of industry growth could be improved (and some believe it would even lead to a more socially acceptable set of projects) if the level of the FiT would have remained at 23 cents/kWh or higher. Indeed, Suisse Eole believes that if the tariff is corrected to actually cover the costs of production, it would allow for an increase in production from today's 20 millions kWh to some 300 million kWh in 2012. A few interviewees also noted that if the cap on the FiT system would be eliminated, then the industry would flourish to its natural limits (the level of growth that the public can actually accept) given that social

[4] This is based on observations (in particular the number of press-releases about new projects being planned), however again these projects have not all been awarded building permits yet.

[5] This information is provided by the Swiss Federal Office of Energy in the description "Cost-covering remuneration for feed-in to the electricity grid (CRF)". More information can be found on: http://www.bfe.admin.ch/themen/00612/02073/index.html?lang=en

acceptance will anyway continue to play a key role in limiting a number of nonsense projects, or projects that are viewed as not acceptable for Swiss conditions. Therefore, they believe the cap on the FiT system is not helpful.

Before we explain such comments, it is important to understand how we arrived at the current situation, in particular the current tariff level for wind power. First of all, in summer 2007, the Swiss Federal Office of Energy (SFOE) sent a revised version of the federal energy ordinance, which contained new regulations regarding a Feed-in Tariff (FiT) for renewable electricity. In this version a FiT for wind energy ranging from 15 to 23 cents/kWh[6] was proposed[7]. A public consultation was initiated. Following the inputs from the consultation, SFOE recalculated the FIT for wind energy and finally proposed a range from 20 to 28 cents/kWh[8]. At the end of March 2008, the Swiss federal government approved the enactment of the revised federal energy ordinance with a few alterations, one of them being the FiT for wind energy, which the federal government set at a range of 17 to 20 cents/kWh[9] [3]. Further information on the Swiss FiT can be found at:
http://www.bfe.admin.ch/themen/00612/02073/index.html?lang=en

Meanwhile, the FiT system even with its current lower tariff level, may have well encouraged increased investment in the wind power sector in Switzerland, and therefore could be considered as a key to the industry's recent growth[10]. However, this report reveals that there are some natural reasons why wind power can be expected to grow less in Switzerland, compared to other countries with a similar FiT system. The current apparent growth that we are seeing today may just be temporary or may be much less fervent after the most obvious project sites are developed. Furthermore, the announced projects have not been approved for construction, in most cases.

It is well-known that social acceptance in Switzerland for wind power has been quite low. In the past, wind power developments have been opposed especially by the association for the protection of Swiss landscapes. Finally, above all the complicated and time consuming planning procedures in Switzerland for wind parks might continue to be a deterrent for investors, and all these factors may lead to a lower growth rate than what is needed in order to achieve the countries' renewable power installation goals, even with the application of a FiT system for wind power in Switzerland.

2. Goal / Objective of this work

One of the major goals of this work is to report on and compare the views of wind power developers and investors as a means to eventually evaluate the developments of the industry and contribute to a full evaluation of the very first results of the FiT program in Switzerland for wind power. In brief our objective is to use practitioners' perceptions on the wind industry and policy developments to analyse policy effectiveness. We achieve this goal by first of all selecting a cross-section of industry practitioners to interview, creating two questionnaires and conducting the interviews at two points in time so that we also capture how views can change from one year to the other (or how views might have changed after the financial crisis hit compared to just before).

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[6] In this report, cents means Swiss Franc cents.

[7] Energieverordnung (EnV), Vernehmlassungsentwurf vom 27. Juni 2007.

[8] Prognos AG, 2008, Vergütungssätze für Strom aus erneuerbaren Energien nach der Energieverordnung – Koreferat zu den Kostenberechnungen des Bundesamts für Energie.

[9] Energieverordnung (EnV), vom 7. Dezember 1998 (Stand vom 1. Januar 2009)

[10] For example, for more information on how feed-in tariffs are viewed by investors, in particular private equity investors, compared to other clean energy policies, see "Which renewable energy policy is a venture capitalist's best friend – Empirical evidence from a survey of international cleantech investors" (accepted in 2009).

The developments we are documenting start with interviews held in the fall of 2008 (just before or just during the first signs of a financial crisis). Through these first interviews we witness the initial state of the industry through the eyes of this industry's practitioners and investors themselves. As the momentum of the industry continues, we interview practitioners and investors again in 2009 and end our journey in June 2009 (well after the first signs of a financial crisis). A complete picture of how the industry fully developed and how the government has led the industry's evolution over time can be later achieved if one could continue documenting the development of this industry in the same manner. A good time for re-conducting this study could be in 2 years from the start of this study, or in the fall of 2010, as we should be able to see a significant evolution in the industry over the next 3-5 years and at that time be better enabled to make statements about how policy has impacted this industry in Switzerland.

Now having said this, this study reports in fact on two parts. Each part actually was designed to address slightly different objectives. Each part has its own findings based on its own set of research questions that were turned into two separate interview protocols. Now continuing with specific questions we have had while initiating this study, through the first part of this study we aimed to answer two main research questions of interest to the Swiss Federal Office of Energy:

- Why do investors finance wind energy projects in Switzerland? Why not?
- If they do not finance projects in Switzerland (or do not plan to finance many projects in Switzerland), what changes (policy framework, planning procedures, etc.) would investors like to see made to change their minds?

From the last part of the study, we found developers and investors had cited many areas where there are higher costs to developments and more delays in Switzerland compared to other countries. They generally asked for a higher FiT and less red-tape involved in the process of obtaining permits for construction.

With the second part of the study, we aimed to answer these 6 major questions:

- Why are there so many applications for the FiT if conditions are not that great in Switzerland for wind power?
- How many projects are realistically going to be implemented among those that applied for the FiT?
- What do developers and investors recommend should be changed in terms of policy?
- How will the financial crisis affect the business in Switzerland?
- What are the keys to a developers' success?
- What will change among cantonal banks?

These questions were considered to further supplement the major findings from the first part of the study.

3. Method

Data Gathering Method

First of all, a first selection of interviewees was made from an initial short list we developed with the help of Professor Dr. Rolf Wüstenhagen and then also from among the Suisse Eole list of wind power industry participants in Switzerland (among which are mostly developers or consulting firms involved in wind power developments). Then with a web search and some calls to existing contacts in the finance community, we located appropriate people to contact in banks and other firms in and outside of Switzerland. Furthermore, while conducting the first few interviews, we obtained information from these interviewees about other key investors and developers in Switzerland that we could contact, as well as other key players in Switzerland that could provide further background about the subject. Among the approximately 30 people that we initially contacted, 17 responded positively to our first request for an interview. Therefore, there was a good response rate, even for the first set of interviews. As for the second set of interviews, we contacted most of the firms that participating in the first set of interviews to request a follow-up interview, and we also obtained a few additional names of key people with proposed projects in Switzerland. Therefore, almost all of the interviewees from the second set of interviews (except the set of pure investors) had a project proposed in Switzerland.

Finally, 13 developers or investors, 2 wind power development consulting firms, and 2 key stakeholders were interviewed for the first half of the study conducted in the second half of 2008. Then in the second half of the study, using the second set of interview questions developed by the author and the SFOE, we interviewed 15 developers and investors of which 11 were developers and 4 were pure investors. The second set of interviews was held throughout the first half of 2009.

We tried to interview the same set of developers and investors for both parts in order to compare their views over time (before and after the financial crisis). Ten of the developers and investors were therefore involved in both parts of the study. Only 2 firms from the first set were not interviewed in the second set (in fact neither had an interest to develop wind power projects in Switzerland, so we decided it was not necessary to interview them again). We also wanted to supplement our second set of findings by interviewing a few additional key investors, therefore in addition to the 10 key firms interviewed in the first part, we also interviewed 5 additional developers or investors in the second part. Among these additional 5 firms, 2 were banks, 2 were public utilities, and 1 was a major renewable energy developer in Switzerland.

For the first set of interviews the sample consists of 9 investor/developers (among which are 6 private or public electricity producers), 4 investing entities (meaning they are not involved in the projects themselves), 2 consulting firms that are involved in wind power developments, and 2 key wind power stakeholders – 1 Cantonal representative and 1 from the association for the protection of Swiss landscapes. Among the firms that can invest in wind power, 9 do invest or plan to invest in wind power in Switzerland and 4 do not invest in wind power in Switzerland. In the second set of interviews, all the developers and none of the pure investors were already investing in wind power in Switzerland.

Indeed, this sample is more biased towards the views of private or public electricity producers and renewable energy developers (as opposed to pure investing entities), but this is the case because these firms are better able to discuss the questions we posed, as they are more involved in the market today. We originally thought we would interview more banks, but we found that the largest banks do not like to finance smaller wind energy projects with project finance while large wind farms are not viewed by such banks as being the norm in

Switzerland. Even one of the cantonal bank representatives spoke about the need for critical mass in order to justify building new specific expertise in the bank in order to assess such projects.

We also interviewed more investors that actually invest in wind power, than do not. 9 invested already in the first set of interviews and 4 did not. Again 11 developers invest in wind power and 4 investors do not under the second set of interviewees. It is difficult to gain the interest of potential interviewees and find knowledgeable interviewees about the subject of this work if they have not already a serious interest in such investments or current wind power activities in Switzerland. The response rate among those that do not already invest in wind power was low. However, further interviews among investors who do not invest in wind power in Switzerland (such as other large Swiss banks, international lenders or other types of investors in and outside of Switzerland) could be conducted later, if that is requested by the Swiss Federal Office of Energy (SFOE). We will have to work with a much larger list of potential interviewees in order to get a high enough response rate among this category of investors.

Analysis of findings

The method pursued in order to report and analyse the interview responses collected in our data gathering stage is one of straight-forward empirical data reporting and qualitative data analysis. Our report contains many direct quotes from the interviews for different topics we have covered. We have decided to make external report completely anonymous. When we write about shared views we only mention when possible the number of people with a similar view and what type of developer and investor generally has this same view (e.g. a few, some or almost all).

We have in some cases supplied the reader with the totality of quotes gathered for certain similar views and left the interpretation up to the reader. At other times we provide the reader with a possible interpretation or we provide some additional information that was not directly gathered from the interviews. This was the case, for example, when interviewees shared views about other firms but did not sure the most candid information about their own firms. For example, we had to interpret the direct quotes with regard to possible strategic reasons for investment in wind power in Switzerland.

Interview Questions

The following questions were posed to the interviewees for the first set of interviews held in the second half of 2008 (see Annex 1 for the full list of questions):

1. Whether they invest in (or develop) wind power in Switzerland, which projects, where, and what type of finance is involved and who are the investors (and for developers, we asked if it was difficult to obtain adequate finance for wind power projects in Switzerland)?
2. Why they invest in wind power in Switzerland or why not?
3. What barriers they face in Switzerland?
4. How important regulatory issues like siting are when it comes to obtaining finance for wind power projects in Switzerland?
5. Which regulations or policies with regard to the electricity sector do they recommend to make it more attractive to invest in wind power in Switzerland?
6. What specific examples could they provide on how they would design policies better, if possible?

The following abbreviated questions were posed to the interviewees for the second set of interviews held in the first half of 2009 (see Annex 2 for the full list of questions):

1. Why have there been so many FiT applications?
2. What percentage of proposed projects will actually be implemented?
3. How do you think the financial crisis will affect these proposed projects?
4. Has your view changed about the prospects for wind power since you learned about the FiT?
5. Do you think that developers' prospects have changed since early 2008 when the higher FiT was discussed and while we were not in such a serious financial crisis?
6. How do you think local politics will affect the success of the proposed projects?
7. What impact does the origin of the project financing have on the success of a given wind power project? Will certain types of developers or investors be more sensitive than others to the financial crisis?
8. What is the expected rate of return for a wind power project in Switzerland, given the feed-in tariff?
9. What are innovative ideas for Switzerland to develop a healthy wind power industry? What lessons can we learn and what ideas can we adapt from the experience in Germany?
10. Do you think large players will have more success or more difficulty with implementing wind power projects in Switzerland? And more questions…
11. Is a higher FiT really justified (as several of our initial interviews suggested)?

A few words on the interview protocols chosen

We held two sets of interviews asking different questions. The first set of interviews was held in the second half of 2008. The second set of interviews was held in the first half of 2009. Each time, our short interview protocol was slightly adapted for each interviewee. In order to obtain the essential feedback needed and allow for a good discussion around each question, the number of questions asked was kept to a minimum. In some cases (for some questions) the interviewee sometimes considered that the answers might be too confidential for their firm. Meanwhile, we found that the response rates were very high for most of the questions and respondents were extremely transparent.

4. Findings

It must be made clear before we begin that this report is a review of various opinions, not facts (even when statements appear to be made, it is good to remember that they are not stated facts but shared stated opinions). Again, everything that appears in this report is not necessarily reflecting the views of the Swiss Federal Office of Energy.

4.1 To invest or not to invest, and what ROI is required by investors?

Why do developers/investors invest in wind power in CH?

In our first set of interviews we asked developers and investors their opinions on why they invest or not in wind power in Switzerland. The reasons they gave are explored below. Note: ROI is Return on Investment.

1) **Several developers believe that the returns are o.k.** - From among the people interviewed in the first set of interviewes, 7 developers or investors (out of 13) appeared to believe the returns from wind power projects in Switzerland today (now that there is the FiT) are sufficient, or o.k., yet not extraordinary. Among these 7, three large developers answered directly that the revenues were o.k. (two privately-owned and one partly public company). Meanwhile the other four did not directly say that returns were o.k., but one can infer that this is the case because they are investing so much money in wind power that one can imply that the revenues are adequate (at least for them). Among this latter group, two are privately-owned energy companies and two are publicly-owned energy companies. Perhaps even though the financial conditions for wind power are not as competitive as other possible investments, this group of energy companies is investing in a large way because their main reason for investing in these projects is political or strategic. Among the 6 interviewees that thought returns are not sufficient, two mentioned that if the feed-in tariff were 23 cents/kWh, then returns would become acceptable for them. Among the other 4 that are counted among the 13 developers and investors from the first set of interviews, they did not really answer this question directly but they were not currently investing in wind power anyway. From analyzing their interviews, it is apparent that they all have a negative perception about the potential for wind power in Switzerland. They cited many problems they perceived in Switzerland such as the much lower scale of projects in Switzerland, compared to other countries (an issue highlighted by one major international bank interviewed). Among those that have experience in the

market already, we can see that each developer or investor has its own notions of what return level is adequate, and we can see that many of them significantly increased their investments once the FiT was implemented. One developer notes: “Yes (my opinion about wind power changed after the introduction of the FiT); before the tariff you could not do it even if you were interested. It was considered too expensive. You needed it to guarantee the expected profits”

In conclusion, many of the developers that are active developing projects today appear to believe that the returns from wind power are sufficient (at least for them). Part of this may be a temporal effect as many are investing now for other reasons (political or strategic). That means that after an initial number of projects are supported, there may be less value gained in terms of public relations for each new project.

However, several mentioned the disappointment they had when the FiT was reduced and then again reduced because of the application of the VAT to the tariff. This may affect certain projects which were borderline attractive or which were found to involve higher costs than originally expected or hoped for. This is relevant to certain types of investors that are not investing for strategic reasons, or obligations that they already had. This combined with the financial crisis and it’s implications on lending and equity investment opportunities for privately owned projects are used as reasons for why the FiT should be increased. If it were increased, some say that the returns for some borderline projects might go into the green area and therefore a larger proportion of the projects that applied for the FiT could be realized, in theory. On the other hand, several people made the point that the real roadblock for many projects on the list will not be financial or related to the FiT, but rather will have to do with local politics and the potential for public opposition to the projects. One project faced federal environmental regulations that restrict developments in federally protected areas.

2) Some developers and investors appear to invest for **strategic or political reasons** - They are investing because of either strategic reasons (e.g. large electricity companies aiming to attract environmentally conscious customers) or because of political obligations to produce a certain amount of renewable energy (e.g. local public electricity companies). It appears that this is the case for at least 5 firms interviewed in the first set of interviews and 6 firms interviewed in the second set. Those that invest in wind power because they want to produce or sell renewable energy perceive wind as one of the most attractive renewable energy options in Switzerland (along with hydroelectric power). One large Swiss project developer said: “There are political reasons to invest. Some utilities are more or less forced by their board of directors to invest in renewable energy because many are state owned. There is political pressure to invest in renewable energy, so it is not purely for financial reasons.”

3) A few might see it as an **opportunity for new players** - The combination of the FiT and the complex permitting procedures in Switzerland opens an opportunity for new players on the energy market to compete with incumbents. For example, one developer said: „We saw that there was an opportunity given the FiT and this provided the incentive...Another reason to invest and enter this market is that the small players could have a chance to enter in this niche....Start-ups can act rapidly and secure the sites first”.

What ROI is required?

In our first set of interviews we understood from developers and investors that returns are o.k. for wind power projects in Switzerland, but not extraordinary. In order to understand what this means, we asked in our second set of interviews what Return on Investment (ROI) is required for developers and investors in Switzerland. When we asked this question

between the months of January and April 2009, a few developers did not answer it or did not answer it directly. However, many enlightening answers are presented here.

It appears that most of the interviewees view the majority of Swiss projects as having not a bad return rate but also not a very attractive one that would attract many private investors. From what we gathered, a project that does not earn more than about a 5% return is probably not going to interest private investors who are mainly interested in making money from their investments, according to what we have learned from these interviews. Therefore, it appears whether the average Swiss return rate is enough depends on the objectives of the investors and developers. If it is mainly to make money then such investors might pull out of certain development plans now that the FiT is a bit lower than originally announced, if that reduction in the FiT level makes their project earn less than 5%, for example. The financial crisis might also make it a little more difficult for certain types of investors to obtain credit for their projects and they may have difficulty going to equity investors as a second alternative because of the low return rate. However, many commented on the fact that many projects will be done for strategic or social reasons. Also, many of the electricity companies that are investing have their own financial resources, so obtaining credit or equity investment will not be a roadblock for them. Indeed, those that appear to be happy with a return rate of between 3-5% or 5-6% are either companies composed of individuals who believe in the high societal value of such renewable energy investments or are doing them because it is either their companies' policy to invest in a certain amount of renewable energy projects, or it is their community's objective to do so.

Here are some of the interviewees' answers to this question:

- "It depends on the life of the project and the social integrity of the company – so whether the firm accepts that some investments may be done for social reasons and not always to make money for the firm (or how much you want for your money). Some aspects of the project may be strategic."
- "It requires a return of 5-6% (at least), and an equity holder requires 10% to go into a project. It is more marketing and strategic for them if they go for projects at 5-6% return."
- "We are already not getting rich. We are just covering the cost and then there is not much left. If you get your ROI it is because you don't book all the costs of the project on the project. If you book every hour on it, it takes 4 years to make a wind park in Switzerland so the FiT will not cover these costs. So every player we know has cross-financed this for the first set of studies, and the time spent on the project such as extra hours talking to farmers are booked elsewhere (only equipment and bills from sub-contracters are officially booked on the project)…. Other players without an interest beyond money would not get into this business even with the FiT. In Switzerland you have to be interested in energy or doing something green."
- "We are making money from the projects, but the money from wind is nothing compared to nuclear energy. Here we produce 5, 10, or 20 MW and with nuclear it is a much larger scale." … "To obtain the rate of return on investment for wind projects (it depends) you can use Retscreen (Canadian government tool) for data, and wind-data.ch also lets you make financial calculations. It is a function of the machine, the wind speed, the k factor (factor for the distribution of the wind), etc. Windpro is another software with a financial module. The ROI depends on various key factors. For example, if you don't have to modify the road, you can reduce 100,000 CHF or even some millions if you don't have to make large modifications to the roads. Some sites we had to put on standby since the reduction of the FiT, but it has not really changed our projects. We do them more for social acceptance (the electric companies). A pure investor will not go for some return on investment

(ROI) that is not much more than 5%. Around a 5% return is o.k. for an electric company due to other reasons."

- "We ask for at least 7.5% minimum on a project. Some expect a 10% or 12% return level. But we are a public company so we accept less. … In our case, prospecting for a project is charged to the company. When you have identified the project, all hours count."
- "I can't answer. It must be higher than investing in housing. That is when you attract capital."
- "Profit should be high enough. I can't answer it because I don't know it."
- "I don't know. We are so far from that now. Only large electricity producers have shown interest so far."
- "We expect an amortization time of between 12-15 years for our project with 20 MW (10 turbines with 2 MW each). It depends on the project. In our case, we have good wind, access to the electricity grid, the roads are already built and there is good access to the sites. We have almost hidden sites in unpopulated areas on the ripples of the Jura – so they are not on the top of the mountains (which is not very socially accepted yet). There is no visual impact and the investment in the electricity lines was already made some years ago, so the project is not going to be too risky or expensive. The only risk is that we are in a federally protected area".
- "3-12%. Even with between 3-5% the economics in general are o.k."
- "You need about a 5-7% return rate (calculated on 15 years), otherwise from the private sector point of view you can not go into it. Compared to hydro plants – which can stay on a site for 80-90 years – where you earn money on the second half of the 80-90 years of its life – this is probably also between 5-8%. Infrastructure projects in Switzerland have about a 5-8% return rate and these are public infrastructure projects (there are not that many privately-owned projects). You cannot fix the FiT on a maximum profit. You do these investments for other reasons than just maximum profit. The banks opt for some investments to be very secure and others to be very profitable, but more risky. These projects are low risk and secure and every investor makes a balance of risks and opportunities."
- "I would not be able to say. We have to wait and see. Already in 2 years from now it will be clearer about which sites will really go forward or not. Not all will achieve their goals because people will fight against the sites during the next 2 years."

When asked how the new Swiss rate of return (after the FiT) compares with wind power project investment opportunities in other countries, one interviewee answered:

"It is hard to compare to Germany because the wind is different, the land is more adequate for developments there, etc. You can't really use their figures. You have to be prudent when using such information."

Why have they not invested (or invested more)?

Investors that did not already invest had mentioned several reasons for this during the first set of interviews we held.

Various reasons for not investing (or not investing more) in Switzerland were (in general) the perception that here in Switzerland there are less attractive conditions regarding:

Wind profiles - One thought that Switzerland is „generally not a wind land, or either there is no wind or too much wind“. Another had the following opinion: „Switzerland is a very challenging area because of the topography. In mountainous areas it is difficult to get the profile for a base case (how much wind is blowing). There is high volatility of wind speeds in such areas and the wind speed would be more stable in other areas like coastal areas, so that naturally would attract investors more.“ Perceptions about wind profiles impact the developers' perception about possible profit margins for projects in Switzerland. It appears that certain types of new investors to this market may stop short after investigating the wind profiles because they see this as the key criteria to their profit margins, and do not consider fully the situation in Switzerland (for example how much the FiT can compensate for this).

Grid access - Some mentioned that there are problems with grid access in areas with good wind. Only one developer mentioned that they were lucky to have good grid connections (underground) in an area with very good wind and no population disturbance due to the optimal location of the site in a ripple of the Jura.

The regulatory approval process - Almost all developers and investors mention that the regulatory approval process across each different canton is very decentralized, long and therefore risky especially for the developers (investors can decide to invest only once the developer receives the permit to build). Besides the cost factor (see below), the fact that it is so decentralized and complicated is a potential psychological barrier for especially foreign investors or investors which would like to invest in different Cantons and may not know the Cantonal and local authorities very well or have appropriate contacts in each place.

Scale - Some larger banks we interviewed require large projects on the scale of 50-60 million Euros of investment, or projects of about 30-40 MW, in order to structure financing. This scale for one project or site is not common in Switzerland and, according to some interviewees, is probably not widely feasible because of the topography, geography, population and the level of social acceptance for wind power in Switzerland at this time. Also, according to other interviewees, there is a limited energy demand in Switzerland, compared to other countries (like Italy and Germany). One company said: “In Switzerland, there is a very limited potential in relation to the energy demand”. So far developers have indeed chosen to develop only a small number of turbines per site, although we can expect that developers will increasingly develop more bundled projects across several different sites and start to develop slightly larger wind parks, adding up to some large enough investments for the largest lenders. For example, in terms of large projects now planned, there is Romand Energie and EWZ that plan to invest in 40 turbines across various communs in the Canton of Vaud. But, not everyone will be able to proceed in such a way. It appears that the first movers will be the most prevalent industry players in Switzerland over time, because of the limited land available for such developments. In conclusion, there will probably continue to be quite a limited potential for large-scale developments in Switzerland, even with a higher FiT, mostly due to the geography of Switzerland combined with social acceptance for wind power.

More on costs – Various higher costs in Switzerland, compared to other countries, were specifically mentioned by developers and investors in the interviews.

Building authorization (development team's cost) – The time that developers spend on the very time-consuming planning procedures in Switzerland and the risk that their time is lost if the project is finally not approved by local authorities is a very important cost. One respondent said simply: „To receive the building authorization, it is a long delay and very dangerous“. Another said: „There are too many claims of citizens that have the power to stop the projects“. Another said: „Opposing parties (e.g. environmental groups) are very powerful in Switzerland and this slows development“. Finally, another said: “Barriers are the long time to develop the site, because of the landscape, local acceptance that takes 3-5 years, and in the end the financing is the minor question in all of that. If you have the permission, then the financing is easy to do. The biggest barrier is receiving the permission to build the turbines”.

This issue is so important that firms are now even more tuned in to obtaining guidance from authorities and environmental groups about what is socially or locally acceptable. This is also clear when we look at press releases for new projects, for example Romand Energie emphasized in a press release about their investments with EWZ that their bundle of projects

are all located in areas indicated in the federal wind concept and the plan of the Canton of Vaud.

Cables – Grid connection cables are more expensive in Switzerland. For example, one respondent mentioned: „Cables for connecting wind electricity to the grid in Switzerland are twice as expensive as in Germany“, and another respondent said „It is more expensive to build lines here because of the topography“.

Turbines – In Switzerland firms have no purchasing power, compared to countries like Portugal. This makes it difficult for project developers to negotiate good prices for turbines. One interviewee explained: “The maximum order is something like 10 and delivery time is 2-3 years…Also, none of the suppliers have service staff in Switzerland. They come from either France, Germany or Italy and this has an impact on the cost because the guys have to travel for maintenance. It also decreases availability (of the maintenance staff for Swiss projects).”

Transport of turbines to site – The transport costs are high for getting a turbine to Switzerland and transporting it to often challenging locations. One respondent explained: “Transport costs are higher in Switzerland, but this is due to the fact that we are far away from any plant. For example, Vestas has to transport a long way and probably there is nothing we can do about this. … For almost every project we have to face small narrow roads and curves and often have to modify the road even if temporarily and this increases cost and in some regions this will kill projects, like in the mountains (sites with good wind resources)”. Another interviewee said: „It is more expensive to build roads here because of winter and other climate and access conditions.“ Another interviewee said: „The problem is for bigger turbines we need to build bigger streets, and we can only pay for that additional cost if you get more money from the subsidies or the market, so we can only build the smaller turbines now. With a higher FiT we could have the same number of wind park sites, but more MWs per site“. Finally, there are simply more physical limitations in Switzerland, compared to countries like Germany. One respondent said: „We cannot put a 5MW turbine on a hill/mountain because we can’t build the road or transport the turbine on the road because of the terrain“.

It appears from assessing just these two questions from the first set of interviews that the main challenge is not really financial even though projects in Switzerland are indeed facing higher costs and sometimes lower profit margins than projects in surrounding countries. Especially for good sites that have applied already for the FiT (and even more so for developers which are backed by energy companies with other reasons to invest in wind power, beyond financial reasons), the main issues are not financial, but local, environmental, and regulatory acceptance and permitting uncertainty (due to the often long and complex local construction permitting process).

While financial concerns are relevant and the FiT now helps make the financial case more attractive for many wind power projects, the more challenging issue to deal with (according to many developers) is the limited potential in relation to energy demand and the difficulties they face in siting or obtaining a building permit for wind power projects. According to one interviewee, “The problems or barriers we perceive in Switzerland are not only relevant to wind power. It is also very complex to get authorization for hydro power plants in Switzerland.”

However, if developers are quick to obtain local buy-in to their plans, and they are successful in negotiations with environmental groups, then they are likely to be successful.. In the second set of interviews we held with developers and investors, we identified several strategies used to increase their chances of success. For example, we look further at the importance of local politics and we investigated which players are more likely to be successful under the current conditions, including the financial crisis.

Finally, for a complete review of reasons why investors invest, or not, in wind power in Switzerland, please see Annex 3. Annex 4 also reviews the key barriers that investors face in Switzerland.

4.2 Why so many FiT applications? ; % FiT applications to succeed

This question was asked during the second set of interviews held. Again, we cover the opinions of developers and investors.

After hearing that conditions were so bad in Switzerland for wind power developments, we wondered why then were there so many applications for projects. It seemed that the two things did not match. This section reviews the many reasons why wind power developers and investors believe this is the case. Overall, we heard again that indeed conditions are difficult, and the real FiT is now even lower, but that many developers filed applications (just in case) because of the cap on the FiT, and because they knew that a certain percentage of projects would not be successful.

Why were there so many applications for the feed-in tariff?

First of all, obtaining the permit to build, and landscape protection was noted by several interviewees as the key issue (but also something one can not predict in advance for a given site):

> "Things have not really changed since the introduction of the FiT and the financial crisis. The situation is still like in the past. The permit to install the wind turbines is the most important thing. The problem is the higher population density and landscape protection is a big thing. I can't imagine that we can install 1000 wind turbines in Switzerland. In the past, finance was never a problem (at least for us) and now the FiT is a financial thing and that doesn't change the situation for us. The bottleneck is still landscape protection, but it is natural that this is an issue in Switzerland." Indeed, perhaps several developers applied for several potential projects because the risk of lack of social acceptance was high and they knew that a percentage of their projects would not succeed for this reason.

A few developers and investors interviewed believed that many developers thought they could change their minds later, but wanted their projects "in" just in case -

> „There is sometimes opposition from the neighbours, but you cannot know this in advance. You can very well apply for the feed-in tariff and then find out later that local acceptance will be difficult or impossible, and then abandon the project."
>
> „I think they wanted to be in, just in case, and they thought they could change their minds afterwards. They probably thought they could make a final decision in the coming 5 years. Also, in the beginning it was a higher actual tariff and then it was announced that the TVA would be included so that means a real tariff of around 18.5 cents."

One developer believed that perhaps some developers thought they could sell their approved projects to other industry players later-on:

> „I found it an interesting observation that many people complained there were a lot of applications for the FiT, and my guess is that not all of them are really interested in realising the projects but wanted to secure the site and then sell the site to another investor to realise the project. Nobody tells you that, but that is just a guess because some of them don't really have the resources to realise a wind project and have zero experience."

One noted that the choice of model allows some to opt for the green energy market later:

> "You have the choice between the FiT or selling on the green power market – but most of the projects applied for the FiT. Maybe some investors will go for the other model, but just in case they wrote the application because you can always change to the other model. But many investors were afraid that if they don't write the application right now, then everything would be blocked. Therefore, most of the projects applied and later on most of the projects will go on the FiT system because selling green power can be done, but you have to work for it and invest in marketing and also it is a matter of the volume."

One interviewee noted that a few developers intended to block the area or were competing for the same sites:

> "Sometimes there are 2 companies on one site, so the number of sites should be less than the number of applicants. Some try to block the area first and then over time try to convince all the owners of the land."

A couple of interviewees believed that part of the "success" is because a portion of developers probably lack experience and underestimate the costs and challenges involved (especially related to permitting):

> "… I think not all the players in the market have a precise picture of the situation in the market. I think they don't realize that the cost level also depends on the FiT. If the FiT is very high there are many people around who are aware of this and want to profit from this situation. It is not just money laying on the street. If it is high, at the end of the day the question is whether the investor can really profit from this situation; my guess is no. Again the FiT is a financial thing, and financing a project was never a problem at least for us. … I am not sure (if this is particular to Switzerland) but yes it is different from other countries like Germany where the population density is much lower and in eastern Germany above all where there is hardly anybody living there and building a wind park there is not a problem and different regulations apply. There you have the FiT and a certain right to develop a project whereas here in Switzerland you have the FiT and that is it. All the rest, landscape protection, etc. is up to the investor to take care of. In Germany there are certain areas where you have the right to install wind turbines. In Switzerland, you must still get the building permit, and there is no guarantee that you get this permit." …
>
> "There will be 3 types of projects – 1) all big incumbents will do 2-3 sites, then 2) the little ones, and 3) merging and acquiring of sites. Some outside developers have some knowledge so they try to bind themselves with an incumbent. But actually (almost) nobody did a wind farm. They did one wind turbine here and there. Wind farms imply studies, network, capacity, etc…."

One key developer thought that financing may be more difficult now for their border-line attractive projects:

"We thought the tariff would be 25 cents. If it would have been at this level, we could do the projects in the Alps. But the big players can invest in renewable energy still and loose money and still do it. As for us, no….but our motivation is whole-hearted."

What percentage of projects do you think will be implemented?

There were various reflections on this question, but all basically believe that only a limited portion will succeed among the current applicants. By the end of October 2008, something like 365 feed-in tariff applications were received by swissgrid AG – equivalent to about 655 MW. Some possible reasons (or at least perceived reasons) behind this large number of applications (despite the challenges in Switzerland mentioned by developers in our first set of interviews) have been explored already in the question above, but the quotes below provide further perspectives on how many projects are likely to see the light and why.

From this empirical evidence, it appears that most developers and investors in Switzerland think that <u>not more than half</u> of the projects that applied for the FiT will actually be implemented.

On one hand perhaps this expectation is too low because some players that we interviewed may be overly pessimistic about their counterparts' plans. On the other hand, given today's much lower FiT level, indeed one can imagine that about half of the proposed projects will be uncompetitive. This is because (at least according to several interviewees) some projects had been planned when the announced level was higher and because of the higher costs in Switzerland for wind power developments, and the higher risks that they take because of the permitting process.

It is interesting to note that in our interview results the private independent investors were the most positive about the prospects for their (and other) projects – even though the FiT has been lowered, while the public investors or strategic investors like power companies are sometimes the most pessimistic about the chances of the many independent projects proposed so far. The pessimists (or realists) emphasize the idea that some developers anticipated a higher FiT level and underestimated problems that their projects might face with public opposition in Switzerland. They also wonder how they can undertake projects in areas like the mountains, where transportation costs and grid connection costs are particularly high, and there are more production related uncertainties because of the location. But at the same time not all of the independent projects' are located in the mountains. Only a portion is located there. Then again, some of the projects in the pre-alps are also uncertain for financial reasons. The large development plans of certain independent firms probably could have worled if the FiT was 25 cents/kWh but now they will be less profitable or even loose money. Then again, some of these projects might be "sold" or the firms promoting them might merge with incumbents increasing their chances of success.

As for the number of large wind parks we can expect in Switzerland, the key appears to be social acceptance combined with the limits of the Swiss geography. Environmental groups will be concerned about especially large wind parks being built in protected areas, but we cannot predict at this time how well different firms will manage their negotiations with environmental groups. We will have to watch the press to know more about the evolving social acceptance for wind power over the next 2-3 years. It is simply interesting to note that currently some developers are only announcing large-scale wind parks or project bundles in areas that are already listed in the Swiss energy concept and existing cantonal plans. This is apparently their current regulatory and social acceptance risk strategy, and it makes a lot of sense. Meanwhile, space is still limited in Switzerland and, again, the early movers are likely to be the most prevalent players because of this. Therefore, moving early into areas already defined for wind power developments is a great strategy.

Quotes on how many FiT applications will succeed:

Those that believe almost all will succeed:

- "Of our projects, I suppose 85% will see the light. I hope all other (developers') proposed projects make it too. …The technical feasibility for Switzerland is about 1200 wind turbines (with turbines of between .8-.9 MW and 2 MW) if there are no restrictions from WWF, etc.) Wind energy is complementary to hydro in Switzerland."

Those that believe half will succeed:

- "250-300 MW is the cap in Switzerland in my opinion. So half has to fall out. We have 8 sites under development and we think 50% will succeed in the best case, and 25% in the worst case. That is how we do our models. We had a pre-selection process - from 80 sites we were looking at 40. Then we chose 8. We think half will succeed, so in the best case 4 projects will go forward to completion. Many projects will be stuck. … The main reason is that Switzerland has a quite high level of participation from the population. When you look at the procedure in the Canton of Bern you have twice the exposure to the public. I would be surprised if any one project does not have opposition. That will be daily business. Local politics will be the back of wind power – that is clear. One can go look at the press to see what the issues are. The bat issue is going to be very heavy. Birds will be discussed. Shadows, sounds and landscape impacts will be issues…"
- "I don't really know, and I can't really comment on the others.".. (and later replied by email): "I don't know….perhaps 1 out of 2?"
- "For an example, consider the case of Valais. I think that 150-200 turbines are possible there and so I imagine that 300-400 turbines are possible in Switzerland as a whole. I always said that 300 turbines would be possible in Switzerland. But the amount that we can do depends on the environmental organizations (not on finance). Also, not all the projects have done the appropriate technical studies. They especially did not all look carefully at accessibility at the sites. For example, in some areas you cannot transport the turbines as easily to the sites. You may have to lift the turbines up to transport them vertically instead of horizontally and then again bring them down to transport them horizontally. Also, not all the project proponents have done the local measurements and have estimated their rates of return based on the national map of best areas for wind."

Those that believe that 1 out of 3 will succeed:

- "There is something like 300 wind turbine projects proposed, right? If we get 100 (of about 2 MW each) - that is already good. So I would say 1 out of 3**.** This person also mentioned the following perceived reason for this: "The building authorization is a very long delay and very dangerous" and mentioned that "…policies could cancel all the "stupid" oppositions", and "common sense should dominate".

Those that believe that only 1 out of 4 or less will succeed:

- "A lot of people anticipated a higher feed-in tariff. Some naïve people are behind projects. They do it more for marketing reasons. A very small portion of projects will come through. We don't have so much wind in Switzerland. I would be surprised if more than 100-200 MW would be profitable. It requires a return of 5-6% (at least), and an equity holder requires 10% to go into a project. It is more marketing and strategic for them if they go for projects at 5-6% return."

- “1 out of 4 – there are many reasons why the project would not go forward (measurement not good, two companies on one site, opposition from neighbours, etc.)”

Some of the theories interviewees had about why projects will not go forward, are:

- Environmental, local or other public opposition for development on the site
- Some developers expected a higher FiT, so proposed projects in the Alps, etc. which will probably not be sufficiently economically attractive now, and will not go forward or will be transferred to developers with other reasons to invest (beyond financial reasons)
- Costs and inconveniences (until they get approved or implemented) are not well understood because of lack of experience by some developers (especially for wind farm developments)
- Some were just holding the place, were not very serious at the time of application, and then would wait and see whether they should really invest or not
- There are sometimes 2 or 3 project developers on the same site
- Unexpected costs can be realised after the initial studies (e.g. access related complications which increase transportation costs substantially)
- Wind measurements might be significantly less interesting under the second set of measurements
- Some say that financing is the minor issue in all of this. However, some projects by especially private independent investors may not go forward if their return rate is borderline now that the feed-in tariff was lowered from the expected level and now that credit prospects may have turned sour and equity might be harder to come by due to the financial crisis.

4.3 Suggested changes to existing policy

What changes in regulation would developers and investors like to see?

We asked developers and investors what changes in the existing policies of Switzerland they would like to see to improve investor acceptance of wind power projects in Switzerland.

Three major changes in policy and two less difficult related changes to the cantonal permitting process were suggested:

- Improve the cantonal permitting processes
    - ....and potentially increase the amount of time for projects to obtain building permits and still be able to benefit from the FiT
    - …and potentially increase communication between Swissgrid AG and the cantonal authorities regarding which projects have received their building permits
- Increase the FiT level
- Open the overall limit on the FiT funds

To summarize, a few suggestions on how to improve the existing policy are:

- One common framework for planning and siting authorization and not different procedures and rules for each canton or at least some rules so developers know what kind of projects can be acceptable and which will not be acceptable for environmental groups, etc.
- At least keep the tariff at a real 20 cents/kWh level (remove VAT), or preferably increase tariff back to 23 cents/ kWh or higher (25 cents/kWh would be ideal for promoting projects across different parts of Switzerland, but of course only where they can be accepted by the community)
- Open the limit on the FiT funds so that more projects can be awarded the FiT, and so that the limit is not the limiting factor for renewable energy developments in Switzerland (note: this was not everyone's personal opinion because some people really believed that Switzerland is not a wind country and therefore the public should not subsidize too many wind projects).

And consider possibly (while they seem to be opposing and therefore poses a dilemma):

- More communication between the grid operator and SFOE so that unrealistic projects without permits for construction do not receive the feed-in tariff and block realistic projects. This may indeed be a problem later if there is not enough money for all the projects proposed.
- Increase the 2 years period for receiving the construction permit for projects that look like they are seriously progressing and not just blocking the system for others, as this is little time for wind power projects to obtain their building permits due to a number of factors mentioned in this report.

A limit on the time developers have to obtain a building permit is necessary, on one hand, to stop "non-sense" projects from blocking the system. However, the most sustainable and market-oriented solution to this dilemma is probably to eliminate the cap on the FiT system, as will be discussed more later in this report. The market and social acceptance would therefore be the real limit for wind power, as it should be.

This is, however, an open question that deserves careful consideration.

For a complete review of all the suggested changes in policy collected from the first set of interviews held with developers and investors in the second half of 2008, please see Annex 5. However, note that the above and following sections include both the interviewee suggestions mentioned in the first set of interviews as well as the second set, while the annex is only composed of the suggestions they had on how policy could be improved (from the first set of interviews). The main suggested policy changes from the two sets of interviews are found in the next sections.

Improve the cantonal permitting process

The main problem that many developers perceived in Switzerland was the long and uncertain process towards obtaining a building permit for a given site. This is combined with the high possibility for local opposition in Switzerland, according to interviewees, because of high population density, high value given to landscape, the power of environmental groups in Switzerland and the sheer limits related to the countries' topography, etc. Pure investors are less affected because they often can require that developers receive their building permits before they invest in a given project.

While some cantons have developed energy plans outlining where they would be open to wind power developments in their cantons, other cantons' procedures towards obtaining a building permit are more difficult to navigate, according to some interviewees. Increased cantonal planning is a definite improvement in the situation. Developers which want to take few development risks regarding social acceptance or permitting could go for sites that are already designated under such a cantonal plan and therefore already have a certain level of cantonal approval.

We also learned from the interviews that developers can seek out allies in the local administration or offer local landowners some of the project's financial benefits, or find other ways to obtain local acceptance of their projects. A standard process across the whole of Switzerland towards obtaining the construction permit is one solution for developers and investors in terms of reducing their development time and risk (upfront development costs), and especially those that intend to develop across different cantons, according to the interviews. Then again, without that, smaller or local developers might have a slight comparative advantage over larger developers.

While local opposition might now be lower (according to one interviewee) because "now the rules are established for developments (such as the distance allowed between developments and human settlements), the federal court decision about the equal importance of the landscape compared to the importance of the countries' renewable energy targets, and the noise level is not that high for wind turbines", there is still quite a concern among developers that environmental groups or people from the local community will be able to eventually block their development plans. The level of fear would probably be much lower if the procedures towards obtaining a construction permit for a site were more standardized and if the cantonal rules for siting wind parks were even more clear for developers of projects.

Problems with the 2-year limit for obtaining a permit, and swissgrid AG

Two related issues were mentioned by a couple of interviewees as potential problems. On one hand, certain developers would like the 2-year time limit for receiving a building permit to be extended, and on the other hand, some developers would like to ensure that nonsense or unwise projects do not block the more serious or wiser project proposals that happen to come later. The views are:

1) The 2-year limit for developers to obtain a building permit in order to receive the FiT is perhaps too short because of the long time it takes to receive a building permit in Switzerland. It could indeed be increased to 3 or 4 years or authorities could be more flexible for project developers that are clearly working hard towards obtaining their

building permit. For example, one public-sector developer said: “We have seen that we have no problem to get sources of finance for the projects – and yes, this is probably because of the feed-in tariffs. But everything is complicated here. We need to get rid of the administrative burden. The 2-year limit to get the permit for construction of the wind power projects is a problem. It is too little time for such big projects”.

2) One interviewee mentioned that there was a lack of communication between Swissgrid AG and the cantonal authorities that provide the permits. This could cause some projects without permits to obtain the FiT in the meantime, according to one respondent, and therefore this blocks other projects that may have a permit first but came later into the system and are waiting on the FiT waiting list. He said: “There is a big lack of coordination between Swissgrid AG and the cantonal office of energy. They have no contact. In the procedure for announcing in Swissgrid AG they could have some contact with the cantons to get a validation before permitting the FiT. Swissgrid AG almost asked why this would be necessary when we suggested it. But there are unrealistic projects that might block others that are realistic….SFOE could do this coordinating job.” Another developer noted: “Now SFOE said all the money is out and we have 2 years. 1 May 2010 these projects will stop. I am not sure what they will do. If they prolong the 2 year limit, that will cut all the projects. Now we can’t propose more projects. So, I hope that in 2010, if some projects did not get realised we hope they will say that it is finished and we take another project. We hope that they don’t prolong the possibility that these projects can happen, because the new ones will not be able to get in. I think the SFOE should accept projects that are between the stage of an opportunity study and a detailed study (not just those that did the first step of an opportunity study).” He also said: “Sometimes the owners give the o.k. to 2 or 3 companies. Doublecounting… Actually, it is the same site. I know because we did it for solar and we were two to announce the same project and swissgrid accepted it. … But this could be changed because they could change the ordannance.”

Feed-in Tariff level should be increased

Among developers that were planning to rely on the feed-in tariffs and not the green electricity market, many were disappointed with the reduction in the tariff from an initially discussed 25 cents/kWh level to a 23 cents/kWh level and then finally to 20 cents/kWh, and then to 17 cents/kWh (potential reduction after the first 5 years). Some might have started development plans assuming the 25 or 23 cents/kWh FiT and then applied to the FiT anyway even though it was reduced. One developer noted: “We thought the tariff would be 25 cents. If it would have been at this level, we could do projects in the Alps.”

On top of that many were disappointed with the application of the VAT tax to the tariffs. This news might reduce even further the profitability of some of the proposed projects and therefore reduce the portion that will finally succeed. According to one public sector developer: “…In the beginning it was a higher actual tariff and then it was announced that the TVA would be included, so that means a real tariff of around 18.5 cents/kWh.” Another developer noted: “The FiT was published and everybody made business decisions and secured financing based on the FiT, and now we are learning one year later that this was to be understood including VAT and we have to reduce all our cases by 7.6 % and the costs don’t change so you reduce the entire profit by that much. It is hurting and we went to the board and approved (the project) based on x profitability and now profitability is x%, e.g. 1 percentage point less. But it won’t change the projects because the ball is already rolling. It won’t stop … but it makes life harder to get new projects approved.”

Then there was the financial crisis (which could be negative for especially certain independent developers). We will discuss the possible scenarios later in this report. Already many Swiss alpine or pre-alpine projects could be borderline attractive at the 20 cents/kWh level. Suisse Eole (the trade association for wind energy in Switzerland) calculated the level required to make up for the Swiss terrain and the high cost of wind turbines would have to be 28 cents/kWh for the first five years, and then 20 cents/kWh for the post-premium period ("Swiss Adopt aggressive feed-in tariff law for Renewable Energy" by *Energy Matters*, 2009).

Eliminating the cap on the FiT system

One problem that some developers identified (in their minds) is that the current number of feed-in tariff applications (if all succeed) has already reached the Swiss financial contribution limit currently decided by the government. If new projects are planned, they will now have to bet on selling their electricity on the green electricity market (which is first more difficult and second limited as well), although there is the possibility of entering the feed-in tariff system if some of the first projects do not make good progress on obtaining their building permits.

Indeed, the statutory capping of the subsidies for the FiT system to 0.6 cents/kWh causes several problems. First, there has to be a laborious monitoring process for the actual sum of the granted FiT means. Part of this monitoring is a multi-stage registration system for projects to enter the FiT. Second, modifications of projects, which have already been granted the FiT are tightly limited to prevent a future overrun of the FiT cap. Planners avoid this limitation by registering multiple versions of the same projects. Third, there are deadlines for the progress of a project. Failing to deliver the necessary documents causes the loss of the FiT grant. This laborious deadline system is to ensure that "dummy" projects will not be part of the FiT system for too long.

The elimination of the cap would:

1) very much simplify the administrative processes and the administrative work; and
2) not cause the cost for the FiT to rise into infinity. The maximal cost for a non-capped FiT system can be calculated by considering the well-known technical, spatial and social limits of the various sources of renewable energy in Switzerland.

Among those that favour the option of eliminating the cap on the FiT, a few telling comments can be noted. One interviewee noted: "If you decide as a developer to go for the green electricity market, you can't sell your renewable energy on the market for more than 12 cents/kWh. It might be possible to sell at a little higher level (maybe 4 cents higher), but not more than 18 cents/kWh on the market. So, the financial crisis is not the biggest problem. The limit on the feed-in tariff is the biggest problem".

Another said when talking about the Swiss government's goals for renewable electricity production, "There is a certain possibility that they will not reach the goal at least not as quick as they want. You have to give a good push – then you can observe if it is fast enough (growth or market development). But you need an effort."

If it has been difficult to gain full support from the population in the past, perhaps now as the industry is more understood by the Swiss people, the option of eliminating the cap on the FiT will be more palatable. One developer said in the interviews: "We need to change the mentality of the people little by little."

It appears important that the government tackle this issue quite quickly. The industry could be paralyzed after a first burst of activity over the next couple of years and the long-term goals might be too difficult to meet or the implications on the industry structure and even social acceptance might be less positive than if this issue were dealt with correctly now.

Then again, those that did not favour this option were those that felt Switzerland is not a wind power country, that we already do enough, and therefore that the government should consider other options to help the country meet it's targets such as investing abroad and importing green electricity or further developing other renewable energy sources such as hydro. One investor said on this point: "It is not good to force something in a country which it is not good for. We are a hydro country. We can't copy Germany's experience." But others disagree with this view. We do not necessarily agree with this view, as we think every country should maximize whatever resources they have, assuming the renewable energy and carbon reduction goals continue to be very important to the people, and there is indeed still a high technical potential for wind power in Switzerland. The question is related to social acceptance (which will weed out nonsense projects by itself due to the democratic process in Switzerland) and how much the Swiss people are willing to pay for generating their own renewable electricity and increasing independence. This of course can be a continuing debate.

Make rules for interconnection clear

One interviewee complained about the lack of clear rules (correct or not) for who pays for what for the network connections up to a wind park. He said, "In France you know what is to be done and it is a mature market so you get stronger rules. But although we don't have a mature market, you have (need) a lot of rules – even on the part you pay up to the network. The process for deciding who pays for what is not yet defined. France and Germany have a clear process. The cost of connection is as high as the wind turbine – so either you get support from the state for the interconnection or you go to the green market. We sell 20 cents/kWh. The best market is Zurich, which is doing a partial purchase of a wind farm and guarantees the green energy because people are willing to pay that much. It goes from 20 cents to 30 cents, so it makes a tremendous sense to invest in such a case. If you have 30 GW x 10 cents/kWh, this is a huge benefit which makes up for the extra costs."

Finally, one major positive aspect of the current FiT regulation was mentioned (and which should absolutely be maintained)– that is:

Long-term visibility of electricity prices compared to green electricity certificate markets like in Italy – One interviewee noted: "We decided not to invest in Italy. If we can't see what the revenues will be for more than 1 year then this is a major source of regulatory risk when such an investment is at least 20 years. The government there can suddenly decide to divide the price by two." Therefore, whatever changes are made to the FiT, the aspect that must absolutely remain unchanged is the long-term visibility of renewable energy feed-in prices. With higher upfront development costs and risks, less stable wind patterns in Switzerland (according to interviewees), and prices of turbines possibly changing, investors need this level of certainty to assure them that their 20-year investment in Switzerland is a good choice when they have other investment opportunities in Europe or in Switzerland. While wind farm investment opportunities outside of Switzerland are a competing option, housing is the biggest competing investment opportunity for the pure investors such as the largest banks. Therefore, both developers and pure investors need the FiT security over time to be confident enough to invest in wind power in Switzerland.

Why increase the feed-in tariff?

Reasons mentioned for increasing the FiT were:

- **Difficult terrain in Switzerland justifies higher level** – One developer said: "Most of the sites are of difficult terrain, and when you look at Europe the areas with difficult terrain have a higher FiT."
- **The TVA was applied** – One public sector developer noted: "We need to fix the TVA problem (not include it). The FiT we can calculate now is not the one decided by the federal government…."
- **Prices of materials have increased in recent years** – The above interviewee also said: "The prices for materials have increased. Copper, steel and civil engineering construction costs and transport costs have increased. If you take on example of ours, the costs increased by 20% in 2007-2008. So we have seen an increase in the costs of these things over the last 3 years. …. In some areas the problem is transport." … He concluded: "We have to somehow produce 5400 GWh of renewable electricity by 2030!" More comments on prices of materials are below.
- **Problems due to the financial crisis** - some reasons for this were:

  A higher FiT **should make it easier to get bank credit** – One developer mentioned: "…First it is difficult in Switzerland because of the terrain, second because of the credit crisis, you have higher equity in the projects now, so you need a higher FiT to keep the IRR in the green zone. This is also what is happening in Greece and Italy. Without any crisis, they needed a higher retribution because to get bank credit is already difficult (due to the difficult terrain and the risk)."

  Some small small and medium-sized enterprises (SMEs) might not invest anymore - One public-sector developer mentioned that many SMEs in their region are currently for their project and may even become local investors, but he said "the crisis may influence their decisions now". This implies that private investment for projects might be more difficult to obtain and companies will rely more on obtaining debt from hard-hit banks, or have to find other financing means (for example partnerships with large energy companies with strategic incentives to invest further in renewable energy). This last option was mentioned by another interviewee when he commented on the affect of the financial crisis on especially developers with a very large number of projects planned across Switzerland, "…so they need to probably open their capital structure to electricity players and probably can't stay independent because of the crisis".

But….

Others said **the financial crisis will not really change the projects of the big energy players** in Switzerland **–** A different public-sector developer thought that the financial crisis would not change the development of projects in Switzerland because the tariffs will be unchanged. He thought: "the only thing is whether the banks start to say they will not lend money for projects anymore. Probably it will not change much though, because the big energy players are rich. Banks also trust them. But in countries like France, that is not the same. They start to have problems with regard to financing. Now some projects have stopped and it is the same thing for solar energy."

And **… It may even benefit strategic or public sector investors –** That is the financial crisis might not be so negative for certain developers in Switzerland. This was the view of one interviewee from a public electricity supplier. He said, "The crisis could be good (for

some) when companies that were pure investors may invest less and there will be less demand for turbines, and therefore the prices of turbines may come down. Now that the tariff is lower, this will also reduce some of the proposed developments on the list (so demand in Switzerland will be lower)." The impact of the financial crisis on the costs of materials is further explored below.

Some also mention that the FiT level is correct assuming you can negotiate the prices of turbines and not calculated return rates based on just the catalogue prices. For example, one large Swiss project developer said: "I can't find good arguments for increasing the FiT…. People asking for higher FiT levels have demands for certain business plans but these are pure speculation. They calculate on wind turbine prices that are catalogue prices and at the end of the day you won't pay that because you can bargain the wind turbine prices." Negotiating prices for turbines ordered is generally the way developers do business, but then again small developers in Switzerland have a harder time negotiating good prices with suppliers because they order so few turbines - 1 or 2, for example.

More on how prices will change – Interviewees generally said that prices of materials (e.g. turbines) have increased *(but may decrease or plateau because of the financial crisis)* –

Some interviewees mentioned that the FiT should be higher because the prices of materials have increased over recent years. They also noted that the cost of turbine transport in Switzerland is very high.

As for turbines, several interviewees confirmed that it has been a suppliers' market until now (meaning that developers could not negotiate lower prices for turbines and that suppliers could set the prices they wanted). While some people speculate that turbine prices might go down because of the economic downturn and the fact that many international projects have been cancelled or delayed, several say that prices will only plateau. One developer noted that while "the turbine market is tense, probably there will be a plateau phase now, but we do not consider (turbine prices) to go down."

Another interviewee explained why costs of turbines have gone up in recent years: "The cost of turbines and the tower which is concrete, have gone up, because of the price of steel and copper going up, but also probably because of increasing margins among producers because of increased demand, and they have to increase prices in order for them to increase production capacity (building new plants in different countries) …Over the last 5 years the price has been increasing, so it is not because of the feed-in tariff. But also suppliers are well aware of the FiT programs in Europe and probably they have a price list for different countries and they might adapt the price of their turbines slightly – like Italy has a slightly higher price for the same equipment. This may be because there are higher short-term prices for green electricity in Italy, but on the other-hand there is no long-term visibility regarding the price of green electricity there."

Everyone is basically watching turbine prices. Some say it depends also on the inflation rate: "If higher, it could change the market – it is unpredictable." But many still believe that it will continue to be a seller's market and that prices could continue to increase after they temporarily plateau.

A few other comments, about how wind turbine prices will change, are:

"The crisis may be good when companies that were pure investors may invest less and there will be less demand for turbines and therefore prices for turbines may come down."

Another large investor explained the global market situation for turbines: "The overall picture is that there will be a reduction in demand, and a reduction in the price of turbines. There will be a contraction of profit margins, but in the long-term the demand will be high. Climate change is a driver for wind power. The future market will be in the United States (and China). The portion of global demand coming from Europe will reduce. The demand is now stimulated by the CO2 limits, and the European targets like: 20% renewable

energy by 2020, 25% renewable electricity by 2025, etc. … We are waiting for a reduction in the prices of turbines because demand is going down…and we are waiting for an increase in the capacity of production. So, in 2010 we expect the turbine prices to go down. We will wait until prices are lower. Then in 2010, there will be an increase in projects. Energy demand is also going down, so we will wait until it goes up again."

Other reasons to increase the FiT:

- **Could allow for increased balance between ecology and the economy** –

"The last argument (interviewee cited above) is that if you want to have a balance between ecology and the economy you have to have the projects at sites with lower exposure. This you can only do when you increase the FiT in order to get to the sites with lower exposure. Originally when the tariff was very high this could have happened. But look at the sheer interest of an investor. At least they will try to get the highest energy with less, so this means bigger turbines. The higher FiT will allow you to go also to more difficult or lower resource sites and you open up the opportunities with a scissor. With a lower FiT you get either smaller machines on good sites, or bigger machines on bad sites. When you look at environmental impacts that will by more destructive…."

Another developer provided the following slightly divergent view in terms of what will happen with a lower FiT. He explained that small turbines are not profitable unless the FiT would be increased: "For a big project it is not simple to get approval but a little wind turbine is not profitable with 20 cents/kWh. For that dimension you will get power which is not so good (20-30 metre high) …you will get less wind power from the machine for the same wind speed, so you need more like 30 or 40 cents/kWh instead of 20 cents/kWh for the selling price..." However, he also noted that the FiT level is not always the culprit for a company deciding to go for a smaller turbine on a given site. He explained: „For 30 meters, one can put 2 MW turbines instead of 800kw turbines, but maybe the cost for transport on the roads is much more for 2 MW because transport costs and a machine that is already constructed is less expensive and the impact on the environment is less (you can find a compromise with the community). If you have the option to put a larger turbine I would go for that model (2 MW) first, but it is not simple to analyse if the site is interesting or not. Smaller turbines will have a lower impact on the landscape. It depends, but it is not linked to the cost of the tariff (it is more linked to the decision between buying coal power or green power). It seems like it would be better for the total social acceptance of wind power to use the best sites and concentrate with 2 MW turbines. It seems we can put 50 turbines in the Jura without it looking like there are wind turbines everywhere."

- **Some imply that more projects could be realized with a higher tariff -**

For example, a different developer said: "With regard to the investment, if the tariff was higher such as between 25-30 cents/kWh, then more projects could be realised." However, another investor thought: "A higher FiT would be good because you can make a return. Is it good for society to make money for investors on something that is not so good for society? The guys in Bern do a good job. …. But don't overshoot."

- **A few imply that we need a strong initial effort and the FiT support level can be lowered later** –

Another developer said: “The government has not understood the FiT – they can decrease the FiT later if they see that developers are making too much money. So you should start with the higher level (23 cents/kWh) and then work on going down over time because if someone is really getting rich then it makes no sense to pay the FiT. So after 5 years they should check if the site has good wind and then if so, the FiT for that site can go down to 18 cents. In the end it could be the same funding out the door, but you encourage developments on sites with good enough wind (like 5 or so meters/second). Now we limit too much. It is o.k. to fund those projects that really need 23 cents/kWh.” Another developer said “There is a certain possibility that the government will not reach their goal at least not as quick as they would like. You have to give a good push to the market – then you can observe if it (development) is fast enough. But you need to make an initial effort.”

Which types of developers or investors do not think an increase in the FiT is required, and why?

Developers that have renewable energy production requirements or company objectives to produce a certain amount of renewable energy, and/or have very good sites secured are not able to justify a higher FiT. Indeed some would be economically attractive even without the FiT because of good wind resources, low or already amortized costs for transport, grid connections, and sites with a low risk of disturbing the local population, and therefore they are not able to justify a higher FiT level because their projects are already attractive without the tariff**.** A few interviewees even admit anonymously that they would have undertaken their projects without the tariffs.

Others openly say that the FiT is correct**.** For example when asked whether the tariff should be increased one said: “It is enough because we already do enough projects. If you compare the tariff to the ones abroad like in France, it is o.k. with 8 Euro cents/kWh (or 12-15 Swiss cents/kWh), so it is higher here. If you increase it, we will construct wind in areas that are unwise. It is better to construct wind turbines elsewhere. It is clear that it is more interesting (the wind and energy output) in France. Also, the EDF tariff is interesting, but still lower.”

In conclusion, whether the FiT should be increased or not probably depends on the politics of the country. A few questions that we can ask ourselves are: Would the Swiss people be willing to pay the price to generate renewable energy locally, instead of continuing to rely on sources of energy from across the border (or dirtier sources of energy or nuclear energy)? How much wind power is acceptable for the local population?

Well, it appears the answer to such questions will fall out of the experiences of the next several years. It is likely that many of the projects proposed will not see the light of day because of public oppositions. But whether the FiT will increase the number of unwise projects, or not, is debatable.

A few interviewees answers appear to say: If projects proponents cannot obtain permits for construction, it maybe does not matter whether they were in line to receive the FiT, because they will not receive it if they cannot finally show that they have received the building permit. They say that these projects that are considered “unwise” might hold up the process for other projects that are more sensible (having more chance of local and social acceptance) but they will not consume government funds at the end of the day.

Also, the FiT will not make it easier for a given developer to obtain a building permit or make up for the risk of not obtaining one after months or years of planning a given project, but in the case that the building permit for a good site is awarded, it can make it easier for the developer to obtain financing especially in a credit crunch and it can make a project with a less good or variable wind profile still remain in the green financially. In that sense, a higher FiT level might encourage a few projects which are borderline economical to be implemented, but if those developers and investors are willing to earn a low rate of return for a project that serves the community or country's renewable energy objectives, why stop them from doing this?

In short, we would tend to agree that an increase in the FiT level and an opening-up of the limit, if politically feasible, would be a good thing for the industry. Only half of the projects that are currently applying for the FiT will actually survive, according to many of our interviewees. We will need to ensure that there are enough incentives for developers to continue other plans in the future (there are still good sites available), and to help the country reach its overall renewable energy targets.

4.4 Perceptions on keys to success and the financial crisis

4.4.1 What are the most important issues for success, according to interviewees?

First of all, several interviewees mentioned that a good site is probably the first real key to success. But they explain that in order to obtain a good site, you need to obtain local acceptance or local buy-in to the project. Then you need to hang-on to the best sites and this is where public opposition can be a major problem (although this problem can be revealed over the 2 first years of development before the developer obtains the building permit for the project). One interviewee emphasized the importance of a good site in his comments:

> "To receive money for a project, first you need a good project and I can not imagine that so many projects are good. It is not so much about management. If there is a good site, it will be o.k., and this is also the case for small players."

Key issues mentioned (potential roadblocks to success):

- Local acceptance or landowner buy-in to the project
- Public opposition and negotiations with environmental groups
- The two above issues affecting the chances of obtaining a building permit on time

A. Local acceptance:

One interviewee from a public electricity company highlighted this issue, and emphasized the power of local communities to obtain what they want from developers now that there is so much competition for the best sites:

> "This is the most important issue. Yes, the local community wants to be more involved now. Their role has also increased now because they can leverage their power to get what they want (they have the power to say yes, or no, to the project). They want to make money on the projects too. It is their own land, so they want to be the first partners if possible, and sometimes that is imperative to them and the developer has no chance to go around it otherwise. So, as a developer you need to understand what they want."

Another developer from a utility had a slightly different view, emphasizing the importance of earning trust in the battle for local acceptance:

> "Either they trust you or you are too late and they have more trust elsewhere. But it is not about royalties because nobody is getting rich."

As for which types of developers (local or foreign) would have an advantage dealing with this issue, many thought that local developers would have an advantage while a very small minority thought it would not matter as long as they could build relationships. One developer said:

> "Many people from abroad are not really familiar with local politics and local politics are really important. Projects in France are different from those in Switzerland, for example. Most investors from abroad do not have this know-how. Also, investors from other cantons (can have problems) although they are more familiar with Swiss politics but an investor from Zurich or St. Gallen has more difficulties with local politics in the western part of Switzerland than say for example us."

B. Public opposition and environmental groups:

This appears to be the main roadblock for many projects and their developers, regardless of who they are, according to the interviewees. It appears the best strategy towards success is communication with the landscape protection association in Switzerland. Another option might be to develop things a little more slowly, instead of announcing plans to develop large numbers of sites with large numbers of turbines per site. However, if communication is good and environmental groups' requirements are respected, even such projects should be successful.

One public utility company interviewee explained that environmental protection of the land (and in fact the land where the entire community is located) was their key roadblock**.**

A private developer said:

> "The bottleneck is still the landscape protection which is natural that this is an issue in Switzerland".

A public utility representative said:

> "Limiting the environmental restrictions and the administrative burden would be key."

Another developer noted:

> "Some developers try to increase the quantity of the turbines that they will order and plan to implement in Switzerland, such as in groups of 20, but the projects are not really realistic. Most projects are actually small, in Switzerland. For the environment or the groups concerned with the protection of the landscape this is not good (for social or public acceptance) when they propose this. It is not good for the industry because it is provoking the environmental groups."

One experience developer also explained:

> "Our philosophy is that the bottleneck is landscape protection, so we invested a lot of time to discuss this issue with the landscape protection association. Of course, we have different views but the worst thing is not to discuss. There we made a lot of progress. The good idea is to talk to everybody that is against wind power"

Is it getting better? ….

Two developers mentioned that things have improved with regard to environmental restrictions, when speaking about how things have changed since the introduction of the feed-in tariff. One of them said:

> "Where we can build wind sites is now a bit broader. Some asked if we could go to the woods and to protected areas for developments. In Basel there was a discussion that resulted in allowing access to environmentally protected areas. So, it is an opening up of thought (after the introduction of the FiT), but on the other hand it also stimulates more groups fighting against it."

Another developer highlighted that the distance between human settlements, etc. and wind power projects has now been better defined, reducing concerns about noise, etc. making it more clear what is acceptable and not acceptable for wind power projects in Switzerland, and a decision was made about the equal importance of renewable energy as landscape to the country, both things helping to reduce reasons for local opposition.

4.4.2 Which types of developers/investors are more likely to have success and why?

Hypothesis 1: *Larger companies will be more successful because:*

- **Financial Advantage** – One developer thought: “Bigger companies (like all over the world) have the advantage in that they can more easily pay the higher upfront costs of developments like the equipment for the wind measurements and assume the risks or the lower investment security or early wind project developments in Switzerland where wind measurements are unclear, longer and more expensive. In other countries (Germany and the Netherlands) you can use other sites to develop an estimate but here you have to put a measurement behind a small hill because the sites are in hilly locations, etc. It takes longer and it is more risky in the beginning. So, subsidies for the development of wind sites are very important. Until you know it is a good location, you already spent 100,000 CHF!”**.** Large companies (e.g. utilities) also have their own financial resources to finance entire projects (or large portions) themselves, which is an advantage during a credit crunch.
- **Lobbying power** - The smaller community developers (in general) appear to fear that the larger players would be more successful because of their influence and lobbying (highlighting the importance of environmental oppositions and the permitting process for sites). For example, one local community developer answered: “Large players have more success because of their influence and lobbying.”
- **Perceived to be more profitable or less risky, therefore can more easily obtain debt financing for projects** - Some of the larger players are also more well known by local communities, or local investors such as cantonal banks, and therefore may have an advantage in obtaining debt financing for their projects. In an interview with one cantonal bank, it was said: “We look to see if the company is profitable and electricity companies are regulated so they would be o.k.; we are already financing these companies”.
- **Big electric companies have existing contacts with suppliers, stability, and are already connected to the grid** (and suppliers have a guarantee when doing business with them) **–** According to one developer: „It is possible that some small or foreign investors are not all informed. Private companies might not know how to do it. You might have to be in the business every day to know how this works. You can start (to pull strings), but at the end you have to have a commercial vision. Private individuals or farmers might be able to do it too, but you have to have contacts with the suppliers. If you don’t even have an SA (type of company) or capital of 20,000 francs, etc. and you need some millions, then the supplier will not have the guarantee. The big electric companies have an advantage and they are also connected to the grid and have resources of their own. You have to be there for 20 years to maintain operations, and they can do it.“ Another investor noted: „Energy companies are more likely to complete the process and small developers are less likely to finish it. ....But ... if there is a good site, it will be o.k. also for small players.“
- **Big electric companies will be able to do larger more profitable projects** – Small projects that can be done by individuals or farmers are not as profitable.

Hypothesis 2: *Local firms and investors will be more successful at permitting and obtaining local acceptance:*

- **Local companies have existing relationships and stability in the area** – Will locals have more of an advantage at obtaining local permits for construction because they know the local politicians, political process, regulations, stakeholders, etc.? One local utility developer said: “If you have existing relationships in the area, you have stability and this is better. Others block (went before everyone else) but they are not likely to finish the project themselves.” Another local utility representative said: “It is 30% an engineering and economic problem, and 70% a political problem.”
- **Local investors in the project will increase local acceptance –** One developer thought: „If finance is coming from the local environment –yes, it helps. For example, a locally playing electric company has a better chance of public acceptance because

people are sensitive to where the money is coming from.“ Also, knowing this, it is likely that local communities will increasingly make more money from wind park projects. At least, they will demand more. One developer notes: “Probably local areas will be different now – they see an evolution in renewable energy and that there is more financial interest (less risk) for the community ... This is due to the FiT.”

Hypothesis 3: *Larger companies will face more challenges with social acceptance than companies implementing smaller projects, and what appears to be new players will be more successful at implementing big projects in Switzerland:*

- **Energy companies have a problem with social acceptance** - As one smaller investor put it: „Energy companies have a problem with social acceptance in Switzerland. Social acceptance is better when a small player does it. People are sick of industry especially with the high feed-in tariff. There is a lack of clarity and that benefits the small players. The big players like one central authorization process to copy in each canton. Smaller players focus on one canton anyway, so they are better at generating social acceptance.“
- **It is not simple to get a big project approved –** Large firms will more likely invest in larger projects because they are more profitable. However, one developer notes: “For a big project it is not simple to get approval but a little wind turbine is not profitable with 20 cents/kWh. For that dimension you will get power which is not so good (20-30 metre high) …you will get less wind power from the machine for the same wind speed, so you need more like 30 or 40 cents/kWh instead of 20 cents/kWh for the selling price.“
- **Large players will want to appear to be small players** – Even one of the larger companies discussed how new players (or those that appear to be new players) might be better than certain large incumbent electricity companies at social acceptance (another key issue). For example, he focused his comments on how certain larger companies might have a disadvantage because they have developed a low reputation among the public because of their past business activities. This is why this interviewee mentioned that there is a trend for electricity companies that had not so good reputations to develop spin-offs of their companies to get established under another name in this market and have a sort of “clear slate” in order to clear their name from their past reputation.

Discussion:

Based on what many developers and investors have said on this subject, it indeed appears that larger companies with their lobbying power and profitability will have an increased chance at obtaining credit, compared to new independent players. Some of the larger utilities which have enough money of their own also offer credit directly to some of their affiliated companies that are acting as a smaller renewable energy developer but which are backed by large utilities. There are also 1 or 2 cases of independent companies backed by larger public and private firms. These are also going to have more chance at surviving because of their financial backing. They also have the stability, existing relationships, grid access, and resources to implement more profitable larger projects. Therefore, they will probably continue to be the most successful players in Switzerland. However, many interviewees noted that permitting is much more of a challenge then finding financing for projects. Therefore, their potential problems with social acceptance because of their past reputation could partly outweigh their lobbying power and financial power advantage. Some of them have probably anticipated this potential problem because many larger firms have created new entities to manage their renewable energy businesses. These entities may have the support of the larger company, providing all the advantages of a larger company, but they might appear to be a new player or somehow separate from the larger firm.

Finally, local utilities (or firms with financial backing from local utilities) are likely to be more successful at obtaining local support for their projects and obtain the final construction permit. Even beyond the value of the permit, local acceptance of a project can influence the potential for local financing potential. Highlighting this point, one person from a cantonal bank we interviewed noted: “If I were a developer, I would first get the authorities on my side, and then go to the cantonal bank”. Therefore, it appears a larger incumbent could utilise their lobbying power to influence the permitting process (especially as the process is so undefined), but local developers (especially utilities) know the area best and might be more successful at getting the local authorities fully on their side, as they follow the local guidelines to siting, etc. and they may have an advantage in their negotiations (or even preliminary talks) with local environmental groups. Having a local investor or financier in the project also can increase social acceptance. This (social acceptance) is the key factor to success in Switzerland, according to most of the developers we interviewed. In the reverse, obtaining the support of local authorities and the public could also increase a developer’s chances of obtaining credit from certain banks, such as the cantonal bank. For example, the cantonal bank we interviewed noted: „Cantonal banks would be interested if the cantons would say they want wind power developments or a given wind power development“.

Unfortunately, the less advantageous player here seems to be the most independent companies that do not have the lobbying or financial power, nor the advantage of being a local. Their advantage so far has been their flexibility and ability to perceive business opportunities early, react quickly, develop first relationships with landowners, gain their trust, and obtain the best sites possible before everybody else. However, from one interview with such a player, we found out that while they “will run the projects on their own”…”The communities also have shares.”

4.4.3 How the financial crisis might affect the business

We have already explored earlier how the financial crisis may both negatively and positively impact costs for developers, as the financial crisis was one of the things mentioned when we asked firms why they thought the feed-in tariff should be increased. Indeed, it will probably impact lending opportunities for projects, prices of materials (although nobody can clearly predict the impacts on wind turbine prices over time), and we have seen a few public or strategic investors comment on how the financial crisis might benefit them, as they are less reliant on private sources of finance (such as private equity) or external debt finance. In this section we review the specific answers that developers and investors provided to our question: “How does the financial crisis affect the wind power business?”.

Review of major impacts mentioned:

- Credit will be offered less by certain banks facing difficulties (not cantonal banks which will continue business as usual) or banks will require more guarantees
- Demand will go down for turbines, making things easier for certain investors who are planning to invest or able to invest anyway despite the more difficult situation for private investors.
- Prices of wind turbines will go down (at least temporarily)
- Prices of materials and services might go down
- Therefore, even more success (proportionally) can be expected from local developers or investors, with strategic interests to invest or which have renewable energy targets.

- Less waiting time for turbines. If there is less demand for turbines from manufacturers (less global demand), there should be less of a waiting period for the machines that the remaining Swiss developers will order.

One interviewee noted the timing issue as being relevant to the extra costs in Switzerland compared to other countries, saying: "…It is difficult to work in Switzerland during the winter and developers are often losing 6 months or so and suppliers know that so even if in the contract they have to deliver (the turbines) in December, they push to April." So, the economic crisis could slightly relieve this timing issue for the remaining developers.

Complete comments about how the economic crisis will change things:

View 1: It will not change much for utilities, but it will impact others:

"No, for the moment, for us, it will not change (but this is the electric power company case) because we have the cash for the project. But if you asked 2 years before there were banks happy to finance almost 100% of these parks, so even a private investor could imagine it. Now a bank will be more prudent and ask what guarantee there is in addition. So it might affect those needing credit. Also, the project approval procedures take so long and each one looks at their environment so the responsible person for x canton will look at whether it affects the birds or whatever, but not how many jobs the project can create, or the economic benefits to the community. So, there may be a negative impact on some developers if they are looking for credit."

"The projects already rolling will probably be realized anyway, but the developers with many projects will find it hard to get all of their projects realized, because you need 600 million CHF for a 2 MW tower, so they will need 1 billion CHF for all the projects. Therefore, they probably need to open the capital structure to electricity players and probably you can't stay independent because of the crisis. They will probably go that way because it is the electricity companies that can get the capital. Even players that try to contact cantonal banks to get their financing, because they might have easier access because of local links and also for social acceptability, even these will face difficulties. It will affect large sized projects and slow down the pipeline but not stop it."

"…the only thing is whether the banks start to say they will not lend money for projects anymore. Probably it will not change much though, because the big energy players are rich. Banks also trust them. But in countries like France, that is not the same. They start to have problems with regard to financing. Now some projects have stopped and it is the same thing for solar energy."

View 2: It will impact all and the crisis will aggravate existing problems:

"The crisis will impact projects negatively. Projects will be cancelled or postponed. I imagine most are bad quality and won't get financing."

"…First it is difficult in Switzerland because of the terrain, second because of the credit crisis, you have higher equity in the projects now, so you need a higher FiT to keep the IRR in the green zone. This is also what is happening in Greece and Italy. Without any crisis, they

needed a higher retribution because to get bank credit is already difficult (due to the difficult terrain and the risk)."

View 3: Less private investment possible:

One public-sector developer mentioned that many SMEs in their region are currently for their project and may even become local investors, but he said "the crisis may influence their decisions now".

View 4: But the crisis might not be so negative for certain developers:

This was the view of one interviewee from a public electricity supplier. He said, "The crisis could be good (for some) when companies that were pure investors may invest less and there will be less demand for turbines, and therefore the prices of turbines may come down. Now that the tariff is lower, this will also reduce some of the proposed developments on the list (so demand in Switzerland will also be lower)." A large bank said: "The overall picture is that there will be a reduction in demand, and a reduction in the prices of turbines." Another interviewee mentioned also that costs linked to services should also come down with the lower demand. But a few of the other comments developers made point to the fact that the turbine prices will not necessarily go down, but will plateau.

A large experienced developer said: "As for the prices of turbines, yes they have gone down globally because many large wind projects around the world have equity investments and they were delayed or cancelled because their investors were affected by the global crisis which led to slower market growth and therefore lower demand and prices for wind turbines. But at the same time, we cannot predict what will happen on the longer term to wind turbine prices. While they may continue to go down a bit more since the hype in prices in early 2008 and late 2007 (because of the rise in steel prices), they will go up again because of increased demand for wind power due to more and more laws being developed around the world like in the U.S. which will definitely change. So the market will not go down so much, and there is some possibility for growth for wind power because laws (like feed-in tariffs) are not developed yet in all countries."

Another developer also noted: "Prices (for turbines) will not go down, but will be stable (so no more rising 2-3%). Now it will not rise for the first year since 5 years. But there is still a good energy sector, so there is still a sellers' market."

Finally, there are other positive affects of the financial crisis that have to do with debt finance. One developer mentioned: "Since earlier this year … there are lots of costs connected to the loans we take for developments and loans are cheap now (if you can invest in the next 2 years). So, you can fix interest rates on a better level than it would have been 1-2 years ago…

4.4.4 What are strategies mentioned by developers/investors to increase the potential for success of their projects?

Suggestion 1. Local acceptance – Focus

One smaller developer noted: "Social acceptance is better when a small player does it…smaller players focus on one canton anyway, so they are better at generating social acceptance."

Suggestion 2. Build Relationships

One interviewee said this: "You have to build relationships. It takes time, but it is possible." … and in this context he also noted, "Outside players should not have a problem in Switzerland. But there is almost no experience in Switzerland".

Suggestion 3. Go to the local community to get their agreement, before anything else

One developer said: “Success is to have the community with you - the commune and the canton has to be o.k. with you and the project. Then getting access to the grid from the local electricity distributor is important.” … “The first thing to do is to talk to the commune, the owners of the land, and whether you will have public or private funds does not matter so much. That is the experience…the way of selling the project, and understanding the other party, and sometimes you find out the mayor is not for it and then it is not worth trying because you will have the entire council of the community against you.”

Suggestion 4. Give the commune what they want

This could be the more typical (and very cheap) option of renting their land, or interest for using the air, or signing a contract where they get a portion of the production in terms of money, or the increasingly more frequent option (but more risky option for communities) of including them in the ownership of the project. One developer explains: “If the community wants to be in the project, you have to let them in, otherwise it will be a failure”….and “You can have a community that wants to be a majority owner of the project or they oppose the project. … The community can have low rates on the loans, and they decide on the permits. …” Several others (public and private developers) agreed that the participation of local investors is a good model for financing projects in order to increase the chances of project success**.** However, one large developer in Switzerland noted: “As a wind power project takes 4-6 years, it is very difficult to keep a highly diversified capital for such a long time in the project.” He also noted the risks for the community of being a partial owner: “It is better to have a good contract with them – they get a portion of the production in terms of money and it is easier to sell politically than the high risk early developments where we pay up to half a million to up to 2 million CHF just to study the site. It involves staff you have to keep up to 6 years, and the smaller the portfolio the higher the risk, but the value of the risk in the first 2 years is very high for a smaller developer as well as for a larger developer. It could be lowered by cantonal planning.”

Suggestion 5. Go for a project already in a cantonal plan, if possible

One developer explained this: “If projects are in the cantonal plans then it will be o.k., but if not, then they will be hard to realize. All cantons start to make plans, but some are very strict.“

Suggestion 6. Obtain all the authorities’ support first and then approach financiers

This is an especially useful strategy for developers wanting to approach cantonal banks for financing their projects, but it is also relevant for developers wanting to approach any type of bank. But other banks might need to see additional guarantees, given the financial crisis, while cantonal banks are more likely to respond if the canton’s officials support the project because they also invest for political reasons and they focus on the canton’s investment needs. One interviewee from a Swiss cantonal bank said: “I would first get the authorities on my side and then go to the bank”.

Suggestion 7. Social acceptance – Communication - Explain, explain, explain!

One interviewee emphasized this key to dealing with local and social acceptance: “The key to success is communication. Discussions with everybody including the association for landscape protection. But this is not really linked to the type of company. Everybody has to do this.” Another emphasized the need to explain that the profits developers make from wind

parks in Switzerland are actually not so high, and this increases social acceptance in the community. He said: “The FiT gives investment security, but because of the increased discussions we have to have (now) with the government, the public, and the environmental groups (due to the democratic process we have in Switzerland), the FiT does not change the situation that much in terms of social acceptance. It even gives you a bit of an “evil” perception because they think that you make money from renewable energy now, and it has not been common to make money from renewable energy in the past. Also, because of the past experience of renewable energy developments like dams, social acceptance is a challenge (companies in the past came and sold the idea of dams which now they say stopped that river, etc.) So the image of renewable energy is not that good in Switzerland.” … “For social acceptance – explain, explain, explain, and also with new people. We explain that it is not that attractive for developers because of all the costs, and we explain that it is a feed-in tariff of not 23 cents, but 20 cents – so people can see that we are not just making a lot of money.”

4.4.5 Ideas on how to make wind power work in Switzerland

We asked in our second set of interviews the following question: *What are innovative ideas for Switzerland to develop a healthy wind power industry? What lessons can we learn and what ideas can we adapt from the experience in Germany?*

Here are the various interesting reflections that the interviewees had on this, many of which focus on strategies developers can take to increase social acceptance of wind power in Switzerland. A few gave some ideas on how regulations could be changed for the better.

“Urbanistic tools in the Canton of Bern is the right way. When you look in the EU, there are two different toads taken. One is the region usually defines a territorial plan which outlines where the wind power can be developed because the NIMBY effect is the biggest enemy to wind power even if you have a good public opinion of it. So it has to be some iron hand involved. Otherwise you do an exclusion planning by yourself and you can observe how it ended up nowhere in Canton of Neuchatel. The more they are involved, the shorter the planning times and there will be different developers and the more of them the quicker the industry will be established.”

“We need to change the mentality of people little by little”

“…We need to get rid of the administrative burden. The 2-year limit to get the permit for construction of the wind power projects is a problem. It is too little time for such big projects.”

“We need social acceptance. We went door to door in each commune and invited each household to come to vote on all the projects.”

“…France and Germany have a clear process (for deciding who pays what for connections to the network). … Cost of connection is as high as the wind turbine --- so either there should be support from the state for the interconnection or you go to the green market…”

“Limiting the environmental restrictions and the administrative burden would be key. In Germany there are around 20,000 projects so they have to have an easier time in terms of administrative burden and I also think that is the case for France and Denmark”.

“The first thing to do is to talk to the commune, the owners of the land, and whether it is public or private funds does not matter so much.”

“It is not good to force something in a country which it is not good for. We are a hydro country. We can’t copy Germany’s experience.”

“It is not a financing issue or other issue, but public acceptance will probably find a limit. Somewhere there will be a plateau and people will say there is too much.”

“If finance is coming from the local environment, yes it helps. For example, a locally playing electric company has a better chance of public acceptance because people are sensitive to where the money is coming from.”

“It is hard to compare with Germany. They have large parks and economies of scale. You cannot be sure if 1 or 2 turbines will be good, so the big utilities play and they know the price of electricity, etc.”

“Our philosophy is that the bottleneck is landscape protection so we invested a lot of time to discuss this issue with the landscape protection association. Of course we have different views but the worst thing is not to discuss. There we made a lot of progress. The good idea is to talk to everybody that is against wind power.”

“For social acceptance – explain, explain, explain! Also we have to explain now to new people (new stakeholders that take an interest now that there is the FiT and that increased public attention). We explain that it is not that attractive for developers because of all the costs, that it is a FiT of not 23 cents/kWh but 20 cents/kWh, so people see that we are not just making a lot of money.”

5. Conclusion

From this study we have seen that two major areas could be improved from the policy perspective: 1) the FiT level could be corrected and the cap on the FiT system eliminated to correctly stimulate investments in wind power beyond those that are undertaken for mostly strategic reasons or local requirements, and 2) cantonal plans for wind power developments or clear guidelines with regard to what type of developments are acceptable in different areas of Switzerland could be encouraged, to reduce the development barriers linked to obtaining the building permit.

First, when we asked why developers and investors invest in wind power in Switzerland and what return on investment was needed to invest, many electricity utilities already investing in wind power felt that the return levels were sufficient, while others said it was insufficient and that the FiT level should be increased. Meanwhile, we assume that many electric utilities are now investing for other reasons besides financial (strategic or political), therefore the currently high interest level in wind power projects may be only a temporal effect. In the future, incentives like the FiT will probably be even more important to ensure a sustainable investment level in the industry, and the right stimulus level must be obtained.

In the current situation – that is without an increase in the current FiT level and given the various cost and administrative barriers that developers currently face in Switzerland - large energy players and local utilities are likely to be the most successful players at implementing their proposed wind power projects in Switzerland, because of primarily the lobbying and financial power of the former and the local presence of the latter. If these two things were corrected, all players would probably have a more or less equal chance at being successful in the implementation of wind power projects, and we would be more likely to achieve the country's renewable energy targets. It is not clear that longer-term growth can be supported in the current situation.

Meanwhile, the financial crisis might make it even more difficult for certain developers to obtain debt and equity financing for their projects. This is a situation that could again favour the larger incumbents that have their own resources. While we cannot imagine every possible scenario, one scenario one can imagine is that a few large players initially invest in a few wind power projects in order to attract customers to their core business, but do not aim to develop the wind power business beyond a few token projects. If other players are crowded-out because of difficult conditions in the financial markets and a FiT level that is not high enough to cover all the actual costs involved in a typical wind power development in Switzerland, then we could imagine a situation where very few wind power developers outside of strategic players are able to survive and flourish in Switzerland, causing a possible shortage of projects in the near-future.

Financing, however, is not the biggest barrier that project developers face today. This report has shown that the majority of the respondents felt that the more important question, right now, is related to permitting. Most developers said their main barrier is receiving the permission to build on a given site, the long time to develop the site, because of the landscape, and local acceptance. As one developer noted : « In the end, financing is the minor question in all of that….If you have the permission, then the financing is easy to obtain. »

Also, while some respondents felt that the financial crisis may negatively affect some players more than others, it is also interesting to note that some of them also thought that the financial crisis could also improve conditions for all developers and investors in the next few

years because of a short-term drop in wind turbine prices. One also mentioned that there will be a short-term drop in the cost of loans due to the financial crisis, which will temporarily improve financial conditions for developers.

We asked them how they saw turbine prices evolving after this initial drop in turbine prices, and several believed that prices of turbines would increase again (in fact they thought they would plateau over the next few years) as policies around the world are implemented to deploy renewable energy. That means a possible short-term drop in turbine prices as a result of the financial crisis could open up a short-term opportunity for developers and their investors, assuming they can obtain their building permits early enough.

Apart from learning how the financial crisis might affect this industry, we were able to learn about the practitioners' perceptions about social acceptance and renewable energy policy in Switzerland and how things can be improved (from their perspectives). Indeed, the main conclusion we can draw from this study is that local and social acceptance is key to wind project success. If developers (both private and public) find and use intelligent strategies to obtain local acceptance and gain the support of cantonal authorities, they have a good chance towards success. Furthermore, if a site is good and the developer is able to obtain a building permit, there should be no difference between large or small firms, utilities or independent developers, or local or foreign investors in the project. Still, many developers and investors believe that the feed-in tariff has made it easier for them to build the business case for wind power projects in Switzerland and has therefore made it possible for them to invest further in this area.

Based on what we have learned, in order to be sure that Switzerland meets its wind power targets on time, three things can be done: 1) increasing the FiT level for wind power, 2) eliminating the cap on the FiT system, and 3) facilitating cantonal planning and increased transparency about what conditions a wind park needs to comply with in order to be accepted by the local community and environmental groups.

If the cap on the FiT system cannot be eliminated at this time, another option for the government to consider is being flexible on the 2-year time limit to obtain building permits (for serious projects). Several developers mentioned that this 2-year time period is not enough for wind power projects in Switzerland because of more challenging Swiss conditions for wind power, the long cantonal permitting process and the potential for unfounded oppositions to projects due to the very democratic process in Switzerland.

A little more communication between communities, developers, authorities, and environmental groups in the next couple of years would help develop a clearer situation for everyone (for example with regard to what types of developments can be generally accepted in Switzerland). This would reduce the amount of time and investment that developers risk wasting in the current situation. Especially in terms of permitting, it would be wise to set the guidelines clearly either federally or for each canton, and work towards a lower risk experience for all in the future. This will also lower the uncertainty that the government currently has about how many projects (among those that applied for the FiT) will actually see the light of day. For the moment, we can estimate that about half of the projects that applied for a feed-in tariff will be completed, if we rely on the expectations of the developers and investors that we have interviewed for this study.

While we cannot predict the future, based on what the practitioners have told us, a couple of possible scenarios for the future of the wind power industry in Switzerland are:

- The FiT level will generally allow only for very good wind situations (probably not lower than 5 meters/second) to be developed in Switzerland. Meanwhile, a number of developers are planning to invest for other reasons (strategic or local renewable energy objectives) and they will continue to invest in a certain amount of projects regardless of the FiT level which many consider as too low for Swiss conditions, but this amount of investment for strategic or political reasons may not be enough in order for the country to meet it's renewable energy deployment objectives.
- Large energy players and local utilities are likely to be relatively more successful at implementing their proposed wind power projects in Switzerland for a variety of reasons, compared to independent players. Some independent players may have less financial resources of their own to rely on, which may make them a little less competitive, especially during a financial crisis. Players that do not have local ties already may also find it more difficult to implement projects in Switzerland.
- However, the financial crisis may also lead more individuals to become more active in their investment choices, therefore we can not predict right now how independent wind development firms will fare during and after the financial crisis.
- The prices of wind turbines will probably decrease temporarily (and soon plateau), offering up an opportunity for developers who can quickly obtain their building permits.
- According to most of the interviewees, only about half of the proposed projects applying for a FiT are likely to be implemented for a variety of reasons explained in this report. Some believe that an even smaller portion of the applicants will see their projects become a reality.
- Developers will likely continue to push for more guidelines, for siting projects, to be published by cantons (or cantonal plans), increasing transparency for developers and reducing their development risks (and costs related to the current long administrative process).
- In the meantime, developers will probably choose to site projects in areas already selected for wind power developments by cantons, and under the federal concept for wind power published a few years ago.
- In any case, developers will probably seek more communication with communities and environmental groups, leading hopefully to an improved understanding about what is acceptable and what is not acceptable in different regions of Switzerland.
- Cantonal banks might get more interested in wind power projects, but only if cantonal authorities push for it. Otherwise, they are likely to wait until other players move first.
- Some developers that face more difficulties with their project plans due to the lower FiT level than previously expected, may choose to finally merge with other developers, especially profitable utilities.

Annex 1 Interview Protocol for first half of work

1. Do you invest in wind energy in Switzerland or do you plan to invest soon [if you are an investor]? If yes, which projects, where, which technology, etc.? What type of finance is involved and who are the investors?

If you are a developer, do you develop or plan wind energy projects in Switzerland.... which projects, where, technology, who finances the projects, etc.? Is it difficult to obtain adequate investment for wind energy projects in Switzerland?

2. Why do you or why do you not invest in wind energy in Switzerland?

3. What barriers do you face as an investor or developer in Switzerland? How important are regulatory issues like siting when it comes to obtaining finance for wind energy projects here?

4. Which regulations or policies with regard to the electricity sector would you recommend to make it more attractive to invest in wind energy in Switzerland?

5. Please provide specific examples of how you would design policies better if possible [both local and national policies].

Annex 2 Interview Protocol for second half of work (Note: slightly different versions were used for each interview due to interviewee time constraints)

1) Why have there been so many applications for the feed-in tariff for wind power projects if indeed conditions in Switzerland are not that good (as implied by the first interviews held in part 1 of our study)?
2) What percentage of the proposed projects in Switzerland requesting a feed-in tariff do you think will actually be implemented? (1 out of 2, etc?)
3) How do you think the economic crisis will affect these proposed projects? Will it cause many projects to be cancelled or postponed?
4) Has your view changed about prospects for wind power projects in Switzerland since you have gained further information about the feed-in tariff?
5) Do you think that wind power project developers' prospects have changed since early 2008 when the higher feed-in tariff level was discussed and while we were not in such a serious financial crisis? Do you think that because the feed-in tariff was settled to a finally lower level (to 20 cents/kWh), a significant amount of the proposed projects will not be realized because actually they were only really attractive with the higher level? How many projects or what MW capacity do you think will be borderline attractive given the new conditions?
6) How do you think local politics will affect the success of all these proposed projects? Will it play a bigger role now that so many wind power projects have been proposed? Do certain investors invest mainly because of local politics or the local communities' clean energy objectives, or other non-financial reasons for such investments? How does local wind power acceptance impact an investor's or developer's decision to invest or not?
7) What impact do you think does the origin of the project financing have (e.g. private or public, large or small financiers, etc.) on the success of a given wind power project?
8) What is the return rate for wind power projects in Switzerland and how is it different from other countries? Do you think that many investors invest for other reasons, and if so, which ones? What is the expected rate of return for a wind power project in Switzerland, given the feed-in tariff (and the expected return without the feed-in tariff)? What conditions like ROI (now, after the financial crisis) do they require to invest in wind in Switzerland? How does the new return rate compare with other investment options in Switzerland? Only considering financial returns, is it equally attractive, slightly more attractive or much more attractive than other large energy investments in Switzerland? How does it compare with wind power project investment opportunities in other countries? (Note: not all the questions were asked for each interview given time restrictions)
9) What are innovative ideas for Switzerland to develop a healthy wind power industry? What lessons can we learn and what ideas can we adapt from the experience in Germany?
10) What type of investor is more likely to complete the process towards final implementation of a project? Do you think large players will have more success or more difficulty with implementing wind power projects in Switzerland? Do you think that private sector players from outside of the community where the wind turbine will be located have a significantly lower chance of project success?
11) How will issues like social acceptance, or lack of clarity in the permitting process probably affect what type of investor/developer will be more successful at implementing their proposed projects?

12) Do you think investors or developers will have to develop special strategies to gain public and local acceptance and approval in Switzerland? What strategies might these be?

13) Do smaller community sources of financing have a better chance of obtaining social and local acceptance and final approval for siting and construction permitting, or do you think that the participation of local investors is a good model for financing projects in order to increase the chances of project success?

14) Is a higher FiT really justified (as several of our initial interviews suggested)?