Transnational study exchange: ForeStClim visit to Germany and France, November 2014

The Mersey Forest, 2014

Contents

1. Introduction

The purpose of the visit was to maximise opportunities for transnational collaboration, building on work that has taken place during the ForeStClim project, including climate twins, and woodland management practice in a changing climate. In particular, experiences were shared in four areas:

- Use of urban trees for water management, including water quality and flood risk
- Community use of woodlands for fuel wood
- Links between forest managers and the health sector
- Links between trees / forests and the education sector.

Participants in the study exchange were Paul Nolan, Jo Sayers and Susannah Gill from The Mersey Forest, a ForeStClim partner, Gebhard Schueler from Landesforten, a ForeStClim partner, and Vũ Thị Bích Hồng, photographer for the ForeStClim project.

The study exchange visited Speyer, Germany, where we met with Steffen Schobel and Fabienne Mittmann of the climate project for Speyer, and the Lord Mayor Hansjörg Eger of Speyer. We also visited the Hans-Purrmann Gymnasium school in Speyer, which has about 1,000 pupils aged 10-18. Here, we took part in a lesson on climate change with teacher Dr. Anke Hänßle-Schardt and a class of 15/16 year old students.

In Redon, France, we met with Christophe Bidaud from Pays de Redon-Breton Sud, a ForeStClim partner, as well as visiting Project Vegepole where we were met by its director Olivier Forestier from ONF (Office National des Forêts), Yves Rocher by Eric Vaucelle (technical director), and Jean-Pierre Arrondeau, co-director of IAV.

The sections below detail the main findings from the visit, as they relate to the four areas of interest set out above. We have also set out other points of interest, which do not fit under any of these headings in a separate section.

2. Use of urban trees for water management, including water quality and flood risk

In Germany:

- In the Rhine Valley there is not much forest, but some occurs alongside rivers as riparian / wet woodland.
- In the valley, woodlands previously suffered due to a low water supply. The groundwater table is very high, but this is extracted for irrigation for the crops (e.g. sugar beet, vines). Rainfall in the area was not enough, at only 550mm per year. So the health of the forests was failing because the water table had dropped too low, and even the possibility of having forests there was becoming untenable. A recommendation to raise the water table was implemented; with irrigation taken from the Rhine rather than the groundwater. This lead to flooding of some basements of houses.
- In other areas of Germany it is not possible to grow forests at all as the land is too dry.
- A beck, a tributary to the Rhine, has been culverted under the main historic street of Speyer (Figure 1). It would probably not be feasible to deculvert it.

Figure 1. The river is culverted under the main street in Speyer

- There have been issues of flooding in Speyer from the Rhine and the backing up of the tributary. There is a sluice gate at a point above where the tributary meets the Rhine, to help control water levels and flows.
- In Speyer, new housing developments have been built recently alongside the Rhine in an area prone to flooding; they can command high prices. Whilst they have been built with flood measures to adapt them for times of flood, they pass on flood risk elsewhere. However, planning policy could be stronger to prevent this kind of development.
- In a more deprived area of Speyer a river has been re-naturalised, with 3km of recreational walking and cycling routes alongside it (Figure 2). The area has been divided into zones, including: more natural and tranquil areas, sports areas, natural play and spaces for communities and schools to gather. Meanders to the river have not been made due to constraints of space, but it is more natural and wider than previously, adding an extra 40m to the length of the river. This helps to relieve pressure during flood events. The neighbourhood is also a lot more inviting now than it was previously, with younger families moving in.

Figure 2. Re-naturalisation of river in Speyer, creating recreational areas and routes

- It may be possible to create more microgardens to capture water upstream, green roofs, water features etc.
- There is a need for more catchment control regionally – e.g. individual towns protect themselves from flooding, but pass on flood risk to the next town. Floodplains along the Rhine could help.
- There is a polder for the city of Speyer, with a woodland area that is wetted temporarily during floods (Figure 3). The climax forest in this area is beech, but the trees within the polder are very diverse due to the flooding, which does not favour beech (or pedunculate oak). In the absence of beech, which has very heavy shade and little ground flora, other species have an opportunity to thrive. The polder protects the airport and an area occupied by the chemical industry, so it is important to maintain flood defences here. There polders may need to be enhanced to cope with larger floods in the future. Floods of increasing duration will put more pressure on the dykes, increasing the likelihood of breaches.

Figure 3. Wet woodland polder in Speyer, protecting the airport and chemical industry from flooding, with a recreational route alongside

- If more green infrastructure was added to the town, there may be an increased demand for watering it in summer, when rainfall and water levels are low. Water could be stored from winter for summer irrigation – including increased use of private water butts.

In France:

- Redon is only 4m above sea level. It has a number of rivers passing through it, including the Vilaine river, with tributaries joining 3km downstream; this is where flooding is an issue. There is a dam which can be closed if the tide is in at times of high flows to protect Redon from flooding. There are also 10,000ha of wetlands around Redon.

- Forest cover is about 25% of the area. Christophe suggested that it is recognised that the forests reduce the speed of the water into the river, and that they are working with farmers to replant areas. Subsidies are available (regional and local funds) but many farmers plant because they recognise the benefits – e.g. they were losing soil, so put in more hedging. (To the west of Paris is a large cereal growing area with no hedges; the soils are lost in high winds).
- We met with Jean-Pierre Arrondeau, co-director of IAV (Institution d'Aménagement de la Vilaine), responsible for managing the river and flooding (Figure 4). IAV was a partner in the Interreg WAVE project along with Somerset County Council. They are also involved in the Interreg project DROP.

Figure 4. Meeting with Jean-Pierre Arrondeau, co-director of IAV

- The Vilaine catchment covers 11,000km^2, with 500 municipalities, and complex responsibilities for flooding. The water board built a fixed dam a number of years ago. River management is the responsibility of the municipalities; but there are clusters of municipalities.
- In the 1970s and 1980s there was a run of dry years, but this was seen as the dam performing well. As a result there was much building on low lying areas. But the dry years did not last.
- In the Vilaine catchment there is slow flooding, rather than flash floods; with flooding in winter rather than summer.
- There were large flooding events in Redon in 1936 and 1995. Similar volumes of water were associated with both. The landscape at each time was different; in 1936 there were more hedges and linear woods, by 1995 there were fewer and the rivers had been canalised and dredged. However, there was only 1cm difference in the height of the floods in these two years. The conclusion is that for these larger flood events, the landscape and forests have little effect on the flooding.

- But, they do make a difference when you consider smaller floods, summer floods and water quality issues. In terms of water quality, woods are not good for all pollutants; but mainly for those that are connected with sediments.
- Rather than large forests, they are interested in hedges and linear forests, as used to exist in the landscape.
- There is a 2014 plan for the catchment which has been made by the commission in conjunction with farmers, local stakeholders, municipalities, etc. The old 2003 plan included rules to stop the destruction of small wetlands, such as obliging mayors to document all wetlands in their local plans. This has now been done for 90% of municipalities. There is guidance to help them in this process, but the work is often undertaken by consultants, with local stakeholders involved in the process. In the new plan, this is now also a requirement for all local hedges and linear woods. There is also a requirement of if you destroy hedgerow / linear woodland you have to replace with double the amount. Municipalities are required to control pesticide runoff.
- The next job would be to do a green infrastructure plan (there is one for Brittany, but at a larger scale).
- They do not have a plan at the catchment scale for where hedges / trees may be needed along the edges of fields; this is seen as a local issue and would be discussed at that level.
- In Brittany, 2% of forests are public and 98% private, with an organisation that brings together the private landowners.
- IAV does not work with urban forests. There is not really a major issue of intensive rain and urban flooding; the region has little slope and low groundwater. There are some issues in Rennes e.g. a project looking at a natural flood area with woodlands.
- With climate change, the main risks are flooding from the sea, from a combination of sea level rise, high tides and heavy rain.
- They have done some work with farmers encouraging them to build dry dams and paying for the loss of farming. Whilst this was successful in some areas, in other areas, with the same incentives on offer, there was little uptake.

3. Community use of woodlands for fuel wood

In Germany:

- There are ancient rights for families that have lived in the area for a long time to take wood for their own consumption from designated areas of the forest. The forest administration would direct them to the most suitable areas each year. In addition to fuel wood, each person, once in their lifetime, is allowed to take enough wood to build a house.
- In the past, people also used to be able to take the leaf litter for use as bedding for animals. This right has now been revoked, with a payment made to people holding the rights, as it was understood that the removal of the leaf litter was taking important nutrients from the forest.
- In the recently designated national park area, these rights for fuel wood are respected. Whilst there are designated areas of the forest which are now absolutely protected, in some areas it is allowed to take fuel wood for the next 40 years only, and in further areas, the right to take fuel wood will remain into the future.
- In the Rhine valley, we passed by vineyards, where biomass willow was being grown alongside the vines.
- Changing silviculture in Germany away from growing large timber trees, to trees for biomass (as try to move away from nuclear power).

In France:

- The French government do not view forestry as important for biomass; they are happy to import it from the US.

- We visited the Yves Rocher site la Croix des Archers, at La Gacilly, as an example of a company that is using biomass for heating (so an industrial, rather than a community use of fuel wood). As part of this visit we also learnt about other environmental initiatives Yves Rocher are involved with (Figure 5).

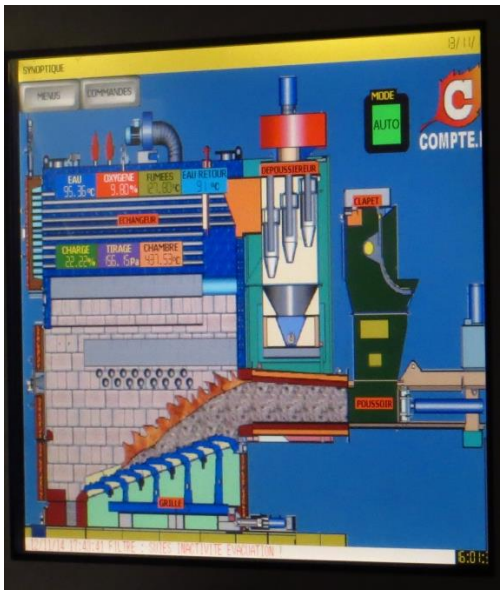
Figure 5. Meeting with Eric Vaucelle, technical director at Yves Rocher

- Yves Rocher is one of the biggest cosmetics companies in Europe. It was established by Yves Rocher and still a family run business. It has 4,000 shops, 16,000 employees, 220,000 working indirectly; in La Gacilly there are 2,000 people employed. 36% of its market is in France. 30% of the plants used in the products are grown in La Gacilly, 20 species. In 1995 it was the first cosmetics company in the world to gain an environmental certification. An Yves Rocher Foundation has been established, which is part of UNEP's Billion Tree Campaign (The Mersey Forest is also part of this). The foundation has planted 50m trees.
- Yves Rocher sees nature as their product. It is therefore important to their company values to try to protect biodiversity; bees are important for the pollination of their plants. Attractive sites are also important for the wellbeing of their employees (Figure 6). They are increasing nest boxes for birds on sites.

Figure 6. Attractive grounds for employees and wildlife at the Yves Rocher site of La Croix des Archers

- The site we visited is a mail order distribution centre for the UK, France, Belgium, Germany and Switzerland. It covers 18ha and employs 778 people. There is a low turnover of staff, with often many generations of the same family employed. They are not actively employing, but replace older staff when they retire.
- Yves Rocher has now established/are establishing a number of biomass boilers at its various sites around La Gacilly. The first was a small wood boiler at the eco hotel/spa, there is a boiler to heat the distribution centre at la Croix des Archers (Figure 7), and another at a distribution centre called la Villouet (about 2km from La Gacilly). Previously gas was used, and this is still available as a back-up if needed.

Figure 7. The wood boiler at La Croix des Archers, Yves Rocher



- The boilers are used only for heating the buildings, not for any industrial purposes, although this may be a possibility in the future.
- At La Croix des Archers, a partner, COFELY, invested in the wood boiler with a grant from ADEME (payback for them is over 5 years) and they also look after the boiler. Yves Rocher pay COFELY for this service (and more maintenance is required than with a conventional boiler), but it still costs less than when using gas, and Yves Rocher do not have the trouble of looking after the boiler. The same system will be used at La Villouet, but at the hotel/spa Yves Rocher look after the boiler themselves (estimate it takes the equivalent of about 1 hour a day to do this).
- The wood is all sourced from Brittany, providing local employment. This was seen as important by the company. Much of the wood used is from maritime pine forests; many in the area are 60-70 years old and ready to be harvested. Saw mills won't take the logs as it has no value (e.g. for furniture). The logs are chipped for the boilers; it can also take bark and leaves (Figure 8). The quality of the wood has to be monitored for water quantity.

Figure 8. Chipped wood for the boiler at La Croix des Archers

- Most of the wood is sourced from other land owners, but they also have their own 160ha woodland (Foret Neuve) of mainly maritime pine. This previously was not actively managed. They have a 10 year management plan for the forest. The regional forest can advise on this for forests over 25ha, but a specialist writes the plan. They have planted fruit trees in the forest. Local employment from managing forest. Their wood provides 300 tonnes of the 5,000 tonnes of wood they require each year.
- There are designated areas where timber can be stored in Brittany; these locations have to be applied for.
- They also have a 2ha trial on their own fields for short rotation coppice (salix) managed to a 3 year rotation. They are not sure how much this will produce. They will test if it is viable to use. If successful, it could help to secure a wood supply. There are pressures on the land in this area for agriculture, but salix can be grown in areas that are less good for crops.
- Last year, they had to not use the wood boiler for a couple of months because conditions were too wet for them to harvest wood without damaging the soil.
- Benefits include: less CO_2 (carbon neutral), local workers, price of wood more stable than gas (which is rising, although now wood prices are also rising), biodiversity improvements from well managed forests. At la Villouet savings are about €5,000/year compared with butane.
- At la Villouet they also have a farm. They have 180 bee hives there and produce a small amount of honey. The honey is not used for the cosmetic products. They intend to give the honey as gifts to their best clients. Bees are a good biodiversity indicator; they grow thistle for the bees and there are 55ha of plants grown for the cosmetic products which the bees pollinate, giving the honey a distinctive taste. Adjacent farmers also benefit from pollination. This site also has a pond, collecting rainwater from the roofs and used to water plants on the site; they are monitoring the biodiversity with specialists. There are wildlife ponds that are not used for watering plants. Vegetables and fruit are grown for their own restaurant for employees and for the hotel/spa, not for monetary benefit of the company; 600 meals per day. They are trying to promote agroforestry.

4. Links between forest managers and the health sector

In Germany:

- Forests provide recreation and tourism, e.g. with many mountain bike trails within the forests of Rhineland-Palatinate.
- However, it was generally felt that links had not been explicitly made between foresters and the health sector.
- There were a number of climate change issues in the city of Speyer which related to health, and Steffen and Fabienne's project was running a workshop relating specifically to health in relation to climate change adaptation.
- The city of Speyer has a historic centre that is largely devoid of trees (Figure 9). This means that the city is very overheated in summer, as it is also situated in the Rhine valley which is one of the hottest areas in Germany, with winds from only one direction. Steffen's project has been promoting the role of green infrastructure, and tree canopy cover, in helping to adapt the city to climate change. Tree planting would also help to make the city more attractive to tourism, especially during the hot summers, encouraging people to stay longer in the city centre and spend money in cafes and shops. However, suggestions to plant trees in the historic centre are met with some negativity as it is felt by some that this would conflict with views of the old buildings, in addition trees may block areas for other uses (e.g. fire engines, markets, etc), tree leaves falling may be unsightly as the city centre is very clean, trees falling in winds causing deaths etc. Steffen has come up with some images/plans, including a fly through, of what the city could look like with green infrastructure. We also discussed the possibility of using a software package called Vis2D, which will shortly be freely available, and would allow photos to be taken of the city and trees easily added to areas. It could be a

useful communication tool. In addition, temporary trees in pots could be used in areas to see whether people actually do like trees once they are there, as it is easy to be negative about any change. At present, palm trees are brought in in summer, but these provide little shade. We discussed the idea of schools sponsoring a tree (there are 20 schools in the city). We also discussed the idea of the trees being moved around every week in a choreographed “dance”.

Figure 9. The historic centre of Speyer is largely devoid of trees and other green infrastructure

- There are some areas in the city centre where trees may be more accepted, e.g. in some squares. Schools could do more with providing shade for summer, with currently much area tarmacked.
- Speyer has a hot weather strategy to try and reduce heat related illness and deaths. This includes heat alerts, information on coping (such as opening doors and windows early in the morning and closing during the day, drinking lots, etc). The strategy appears to be about reacting and responding to heatwaves, rather than planning and preparation in advance to make heatwaves less extreme. In England, the Heatwave Action Plan includes elements about planning to reduce heatwaves by increasing green infrastructure.
- Older people are moving to the city because of health infrastructure availability. But this will mean they are more vulnerable in hot weather.
- There is little use of air conditioning in the city of Speyer. The city do not want to encourage this, unless green energy is used. They have ambitious targets to reduce CO2 emissions and use only renewable energy.
- Potentially water from the rivers could be used for cooling.
- There was no real mention of people using forested areas for cooling.
- It could be possible that malaria returns, as presently lots of mosquitoes.
- There is much pressure on land in Speyer for new houses, but little land to build on. Some new housing is on an old French military base. There is one wedge of land towards the Rhine which has been left open, it has since been recognised that this may be a good funnel for air into the city, as it is from the direction of the prevailing wind. However, there are now increasing pressures to build here also.

5. Links between trees / forests and the education sector

In Germany:

- In the forest of the Rhineland-Palatinate there is a Forest Sustainability Centre, for the public to learn about forests. For example, there will be events there such as teaching people about edible mushrooms, an outdoor Christmas market in the forest (which is very popular and the whole road is closed off for parking).
- Steffen Schobel is working on a 3-year project about adapting the city of Speyer to climate change. It does not have funds for implementation, but does do a lot of awareness raising, workshops and events, including working with the high schools in Speyer and taking temperature measurements in the city. It was felt that the topic of climate change was more suited to high school rather than primary school students. As part of our study exchange we visited the Hans-Purrmann Gymnasium school, to take part in a geography lesson about climate change with a class of 15-16 year old students (Figure 10).

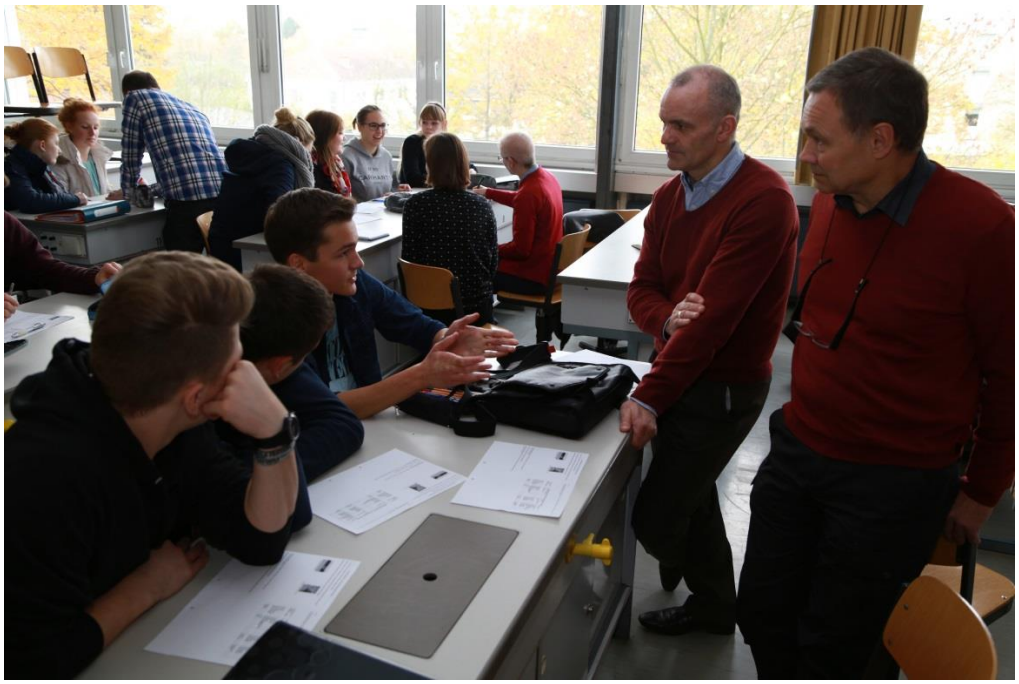
Figure 10. Geography lesson at the school

- During the class the teacher looked briefly at the effects of climate change (e.g. images shown of a polar bear on ice, dry tree in a desert region), reasons for it (e.g. graphs of rising CO_2 levels and increasing temperature), and possible effects in Speyer (e.g. photos of Speyer floods in May 2013 and a hot summer in 2013; Figure 11).

Figure 11. Image shown to the pupils of flooding and hot weather in Speyer

- The class then worked in groups for 15 minutes to answer two questions: (1) explain experiences of climate change in Speyer, (2) how could Speyer be adapted to this. The study exchange participants joined the class groups to discuss these topics (Figure 12). Afterwards, the class reconvened to share their thoughts. We also explained the work of The Mersey Forest, including with schools, and the class asked questions.

Figure 12. ForeStClim partners working with the class groups



- There were discussions about the flooding of the Rhine (which often occurs in spring with melting of snow and glaciers). Other floods occur after heavy rain. Houses have been built close to the river, so there is little room within the city to hold back water. There is also a small river that runs under the city centre with a sluice. This can add to flooding problems. The students discussed building dams upstream to hold back water; creating bigger polders upstream to hold water. In summer there is less rain, and problems of not enough water. Other discussions focussed on hot summers when the city centre became unbearable. The hottest temperature recorded was 42°C. The students swam in lakes to keep cool, but there were sometimes issues of algal blooms, which meant that it was advised not to swim. The lakes are quite a distance from some areas of the city (about 30 min cycle). Tree planting for cooling and shade in the main street was discussed; the students thought there may be issues with destroying the street surface. Use of reflective surfaces for buildings and green roofs, and creating spaces with water (e.g. fountains to circulate water and air). Students also discussed issues to reduce CO_2 such as eating less meat, travelling by public transport (to reduce pollution).
- The school had a largely sealed grounds, with little tree cover and shade for hot summers (Figure 13). We discussed the work The Mersey Forest does with schools to help plant trees and improve school grounds, and the different funding streams available for this.

Figure 13. The largely sealed surfaces at the school

In France:

- There is little social pressure/support in France for woodlands (e.g. as has recently been seen in the UK) (Figure 14).
- In the Redon area, schools are sometimes involved with woodlands, but there are no staff to run events or to keep the connections going.
- There were no community events this year due to lack of staff, but next year prior to planting by the forest Christophe would like to involve people from the start – to create ongoing communication, create ownership, care for the trees, and public pressure to support work in the future and encourage / lobby for political support and funding.

Figure 14. A community woodland in Redon, France, which has had some new planting and interpretation (in French and Breton) as part of ForeStClim

6. Other points of interest

In Germany:

- In the Rhineland-Palatinate area, about 50% of the forests are owned by the communities (equivalent of parishes), 30% by the state, and the rest in private ownership. Both the community/parish and state forests are administered by the state forest office. The state currently manages the forests, and any profits, from e.g. the sale of forest products, is returned to the parish. However, this is currently being looked into as there is a monopoly issue. The administration of the community/parish forests may change as a result. In general, the parishes with larger woodland areas (e.g. greater than 100ha) are keener to separate from the state administration, employ their own forest workers etc. Some parishes may be able to join together to manage the administration.
- In the forest of the Rhineland-Palatinate, there are artificially constructed rivers/canals which used to be used to transport the timber down to the Rhine.
- Villages in the area, from mediaeval times were primarily for forest workers. Some animals such as cows and goats were kept, but there was little grazing land and the soil quality poor.
- Landesforsten predominantly have research staff who visit the forest for their research purposes.
- We discussed issues relating to green infrastructure with the Lord-Mayor of Speyer (Figure 15). He said there will be a new fire station in the city, but this must be central, and the only area possible was on an existing green area. The city of Speyer is an attractive area to live; it has been scored the middle sized city with the most expensive rents in Germany. In Germany these days, people don't necessarily live where they work, but choose to live elsewhere where the environment is more attractive/better services/infrastructure, and maybe increasingly to

areas that are cooler. There is a risk for cities that people will work but not live there, so need to make attractive.

Figure 15. Meeting with the Lord-Mayor of Speyer

In France:

- About 25% of the region is forest cover; Redon is the least wooded area. It sends to be pedunculate oak in the more humid areas such as valleys, and maritime pine on the hills. Also American pine.
- There are a number of economic development areas scattered around to reduce travel times and not build up one central area.
- Project Vegepole is on the outskirts of Redon. The site was set up in 1967 to produce trees, such as chestnut and beech. For 40 years, private nurseries got trees from here, but then they started to produce their own. The ministry decided to close the site and use it as a research station – to create a science park for climate change research and to gain economic advantage. The research is for national knowledge; it is linked to other research centres in France (there are 3 similar sites in the south of France, central France and here, each with different species of interest; Gebhard thought this was similar to in Germany) and part of a poplar research group. There are also discussions with private research groups too. The research findings will be applied by the main French tree producer to sell in the future.
- The site has three objectives:
    - Conserving forest biodiversity and being an international lead on forestry
    - Trying to find climate change answers and increasing knowledge about trees adaptation to climate change through education
    - Producing more trees (between 50,000 and 60,000 per year)
- There is a small research team, many from the national agency.
- The site is currently being redeveloped / restructured, with buildings being renovated to make them more fit for research, new buildings to enhance the supply chain (Figure 16), and

three new greenhouses, two of which will be used for experimentation, e.g. to reproduce different climates, humidity, temperature, etc.

Figure 16. The construction of new buildings as part of Project Vegepole

- The aim is to plant trees and observe their growth. Research is looking into the genetics and provenance of the trees, and selecting trees which are adapted to particular conditions (it is not genetic modification). Trees are cloned, with about 25k plants produced. There are about 125k "mother" trees, of which 6k are genetically different, and these are coppiced in order to reproduce new trees.
- Not really about large scale production; natural regeneration is also important.
- The people they sell to cannot produce varieties from this site without permission. They buy the right to the tree, not the strain.
- There is a national collection of Ulmus, with 400 genetically different trees (Figure 17). They test their resistance to diseases such as Dutch Elm disease (e.g. injecting disease into plants and observing leaves and branches). They are now looking for a test area to plant trees and to develop seed banks. The process is to collect trees from elsewhere and plant here, test their resistance, then move to plots elsewhere and produce seed.

Figure 17. A collection of elm trees

- There is a national collection of walnut, which is mainly used for expensive and high value furniture. They aim to produce more high value trees here. These will be planted at another site (about 20km away) for security reasons (e.g. in case of disease or fire); they will also be planted with a greater spacing (10m) to allow them to grow to maturity.
- There is a collection of Sorbus collected from fields and gardens for diversity. Rowan is a very strong wood, which was used for cogs in mills – perhaps in the future there may be similar uses again.
- They also plant trees outside of this area to see impacts of different climates on different trees – collaborative partnership.
- Pedunculate oak is a local variety adapted to higher rainfall, it is not the same as the oak in the south of France.
- Their job is to protect national trees, but this must include exotics which may be the trees of the future. There is a European project (now reaching the end of its 3 years) to collect seeds and produce plants from them, using greenhouses at the site as nurseries (Figure 18). All trees are tested for higher temperatures. 30k trees of 25 different species have been produced in this project. These have been planted from Portugal to Scotland, in a variety of "real" and different conditions where they will be observed.

Figure 18. Greenhouses producing plants for a European project

- Plant nurseries produce lots of trees, but tend not to trial lots of varieties; which is what is being done here.
- There are few people who plant trees in the area; in France they tend to be very old workers.
- When owners die, the land is divided between family – so sites become smaller and smaller, with more complications and people to consent on changes. It's easier for landowners to grow short term crops such as maize.
- 7,000 beech trees have been planted with children in Verdun, in the east of France, to commemorate the first world war.
- Can compare mother trees with those planted further north. Beech is a species which is disappearing from this area. They can evaluate the species in stressed situations.
- We discussed which trees are requested for economic use – e.g. beech timber is exported to China (where there are not enough trees for timber). France both imports wood and exports its own. We need to know which trees are adapted to the climate as well as which are of economic value, and then decide if we should import or produce our own). In central France, oak trees were planted for ship building which is now not of such great importance, but they can be used in other ways; we cannot always predict demand. In the US, wine is produced in steel vats with pieces of oak added for flavour.
- The balance of payments for forestry is negative in France (i.e. more imports than exports); the industry has not adapted (in Germany it is positive). Spruce timber is imported from Latvia.