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## ABSTRACT

This report is based on a cooperation between NORAD and NVE. It contains three separate papers. The first deals with main principles of energy legislation in general. The two other deal with the Norwegian water resources legislation and the Norwegian Energy Act. In addition to giving information about the legal situation in Norway in this sector, the latter two papers should be suitable to illustrate the principles dealt with in the first paper. One important aspect is to describe the connection between the legal framework and the specific characteristics of each national society.

The purpose of this report is use in connection with projects on preparation of water resources and energy legislation in developing countries.

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## SUBJECT TERMS

Energy Legislation in general  
The Norwegian Water Resources Legislation  
The Norwegian Energy Act

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# **1. ENERGY LEGISLATION - OBJECTIVES OF AN ENERGY ACT, MAIN PRINCIPLES TO BE DECIDED, DIFFERENT ENERGY ACT STRUCTURES**

## **1.1 OBJECTIVES OF AN ENERGY ACT**

### **1.1.1 Main objectives of an energy act**

Providing law is the stage between policy making and realisation of the political objectives. When starting to provide the legal framework, the major part of the policy making should be completed and the main political objectives decided. Such objectives could be:

- optimal use of the resources, which comprises natural resources, personnel and capital a timetable for electrification of the country
- satisfactory security of supply in the developed areas
- the level of the tariffs
- environmental goals linked to the development

It has also to be decided which practical measures to carry out to obtain the objectives. Such measures could be;

- developing hydropower projects or projects based on other sources
- set-up of the administrative/institutional structure in the sector
- set-up of the structure of ownership - public only, private only or mixed public and private

The superior objective of an energy act is to establish a legal basis for the measures to be carried into effect to obtain the political objectives in the electricity sector. That includes providing the legal power to the different authorities involved.

### **1.1.2 Major issues to be considered**

The energy legislation has to regulate the balance between different public interests, for instance national interests versus local, and economy versus environment. Different private interests in conflict also have to be regulated, power companies' rights against people's rights to fishing and water supply. Legislation is also very much about regulating the public interests against the private interests, for instance in connection with taxation and compulsory acquisition.

All these kinds of regulations are of great importance for the possibilities to get private investors, domestic or foreign, to participate in developing the electricity supply industry. Security for the investments is a major condition for the participation of investors. A key word in this connection is «reliability». The political situation in the country in question is probably the most important element

concerning reliability. But the legal framework is also of importance, and the preparation of the legislation is also easier to affect than the political situation. So if participation from private investors is wanted, their confidence has to be obtained through a proper legislative framework.

Some current items concerning reliability in an energy act shall be mentioned. The conditions given in the licence, for instance about measures to reduce environmental damage, economical compensation to local interests, royalties, how to regulate the watercourse, the duration of the licence and what is to happen at the expiration of the licence, must be fixed for the whole licence period. It should be possible with some amendments, but not with dramatical changes. The investors also have to be ensured that their property and rights will not be expropriated without complete compensation, during the licence period.

The energy legislation also has to be considered as a part of the total legal framework of the country. The investors also need security through taxation law, company law, law of contracts, administrative law, and so on. Therefore it is not satisfactory just to have a legislative «peak» in the electricity sector. The total legal framework of the nation has to be satisfactory.

The legal framework also has to be considered in connection with the institutional framework and the system of courts of justice. The entities involved are dependent on having their applications and other matters dealt with by the authorities in a proper way and within a reasonable time. Thus it is important to have a competent and efficient public service. Meanwhile it is not very useful with a splendid legislation if it is not possible to get a fair trial when contradictory interests come into conflict. Thus a court of justice to carry the parties legal rights into force is also required.

Security of investments is not only important for the investors, but also for financial institutions which are supposed to provide loans to projects in the electricity sector, both to private investors and to public investments. Before decisions about investments are worked out, both the investors and the financial institutions will check out the legal and the institutional framework, and these will be compared with corresponding frameworks in other countries in question for investments. Thus these frameworks are important elements in the competition about investments.

In a situation like that, and in general, «transparency» is another key word. The legal framework, and information about it, must be clearly set out and available. Not only the energy act and the regulations, but all the legislation concerning the potential investor, and all the sources of law used for interpretation. Also information about the different authorities' power and responsibility is important.

The energy legislation in Norway, for instance, does not bring the participants in the sector optimal reliability and transparency. But we have a stable political situation and a financial, institutional and legal framework developed over a very long time. Therefore the investors trust the system in spite of the legal flaws. The developing countries are in a different position. To some extent they have a lack of these stable elements mentioned. For this reason the investors and the banks probably require more of their legal framework. Therefore such countries can not allow themselves to adopt our legislative shortcomings.

In spite of the difficult situation in many ways, developing countries have an advantage compared with the developed countries in connection with providing energy legislation. Many of them start almost from scratch and have the possibility to have their law clearly set out. Before a simplification of the energy legislation in 1991, Norway had 3 different acts on water resources and 5 acts applying to different sides of the electricity sector to regulate matters concerning hydropower. A fragmentary legal framework like that is a result of development of society over a long period.

When providing legislation, not only the final result is of great importance. To learn from the process itself is also important, because there will be need to make amendments and to provide new legislation according to the development of society. In connection with providing law, national interests, history, traditions and local conditions have to be considered. Therefore, it is not a preferable solution to copy other countries law or to let foreigners write the acts.

## **1.2. MAIN PRINCIPLES TO BE DECIDED UPON WHEN FORMULATING AN ENERGY ACT**

In this paper there are two issues left to handle; «main principles to be decided upon when formulating an energy act» and «different energy act structures». These items are strongly interlinked. That is because the main principle decisions upon formulating an energy act have strong influence on the structure of the act. When the principle decisions upon formulating an energy act are taken, the structure is to a large extent decided at the same time. Thus the main principle decisions and the main structure, which is very much the same, will be handled first. Later on the more detailed structures showed by examples, will be dealt with.

### **1.2.1 What kinds of energy?**

There are many kinds of sources of energy which meet different needs, such as oil, gas, coal and water. Oil and gas can be used to fuel combustion engines, for heating, for cooking or to «fuel» electricity generation. First of all it has to be decided whether the energy act shall cover both the sources and the utilisation of the energy. If it is decided that only the utilisation should be applied to, the next step is to find out if all kinds of use should be regulated by the energy act, or if it is appropriate only to regulate electricity.

The crucial point in general, is to find out if the matters in question have sufficient common characteristics to make it suitable to have a common regulation. Exploitation and utilisation of oil, gas and coal have some characteristics which are very different from providing and using electricity. Thus it will probably not be appropriate to apply to all these issues by the same act. Matters concerning the sources of energy are often covered by natural resources law.

### **1.2.2 Electricity «fuelled» by all kinds of sources?**

The next question is whether an energy act should apply to electricity generated by all kinds of sources. Possible sources may be water, oil, gas, coal, solar or wind. At this stage the differences of characteristics of exploitation of the different types of use of energy are no longer relevant. The issue to be regulated now is generation of electricity. The characteristics in common in connection with generation of electricity independent on what sources to be used, probably exceed the differences. It is also an advantage to make the considerations about which sources to be used and to balance them against each other according to a common legislation. In Norway, and probably most other countries, generation of electricity by all kinds of sources is regulated by the same act.

### **1.2.3 What kinds of operations?**

The electricity supply industry involves several kinds of operations, such as generation, transmission, distribution and sales of electricity. Each of these operations is a part of a vertically integrated order concerning the electricity supply industry. At the same time there are operations with similar characteristics in other sectors. The alternatives are either to regulate all the operations in the vertically integrated chain in one act, or to assemble operations with similar characteristics in the same act.

The considerations and tasks executed in connection with the different operations concerning electricity supply are closely interlinked. That is why the utilities in this sector often are vertically integrated, which means that all the operations are worked out by the same utility. The authorities usually assemble the administration of all operations concerning the electricity supply sector. Both for the operators and the authorities, it is an advantage to collect the competence concerning more than one type of operations. There should be no doubt about the suitability of regulating all the vertically integrated operations mentioned, in the same act. That is why there is a need for an energy act.

### **1.2.4 The energy act - water resources legislation**

Many countries have a potential of hydropower. At the same time the watercourses are used for other purposes, such as water supply for household and irrigation, other agricultural use, fishing, navigation and recreational uses. The watercourses are also an important part of the social- and ecological orders which are influenced in different ways by different utilisation of the watercourses. Thus there is a need for a legal regulation of the total utilisation of the watercourses. The question is how to organise the connection between the energy and the water resources legislation, concerning hydropower. It is probably appropriate to have one act on electricity and one act on water resources. Then the consideration is if a project for development of hydropower should be handled by both the energy act and the water resources act, or only by the energy act. There is no obvious answer to this question.

The choice of legal structure should also be considered in connection with the choice of institutional structure. In some countries water resources and energy are handled by the same ministry, while these responsibilities are divided in other countries. If two different ministries handle the energy act and the act on water resources, the decisions about a hydropower project have to be co-ordinated. If the two ministries can not agree about the solutions in a situation like that in Norway, the decision is made by the Government.

The situation in Norway may illustrate the complexity of the issue. In Norway power production is of major interest concerning utilisation of watercourses. A consequence of this fact is that energy and water resources are handled by the same ministry. On the legal side a hydropower project is regulated by an act on acquisition of waterfalls, an act on regulation of watercourses, and a general act on water resources also regulates some parts of the project. The generation, transmission, distribution and sale of electricity are regulated by the energy act. The Norwegian system is perhaps not preferable, but it illustrates the complexity of the issue.

Nepal recently got their legal provisions on hydropower development. They have provided one act on water resources and one act on electricity. The use of the watercourses for hydropower development is regulated by both acts. The priority of the different use of the watercourses is regulated by the water

resources act, but the licensing of hydropower projects is regulated by the electricity act.

Independent of the choice of legal and institutional structure, the important thing is that the development of hydropower generation is considered and balanced against other kinds of sources of power generation, and against other kinds of utilisation of the watercourses. The handling of hydropower projects will probably be smoother if all these considerations are made by the same authorities. Each country has to make their choices based on their conditions and interests.

### **1.2.5 The different levels of legislation**

The possible legislative tools to regulate the energy sector are acts, regulations, licences and contracts between the authorities and the investors. Which of these elements to use, and the connection and balance between them, must be planned before starting formulating the energy act.

The scope of both acts and regulations is general, concerning all entities involved in the sector. In the act the main rules and framework for what and how to regulate by the regulations and licensing are laid down. The regulations are more detailed and complement the act. Regulations applying to the entire sector could be collected in one unit, or regulations of different fields in the sector could be separated in different regulations. It is difficult to tell exactly what to regulate by the act and what to regulate by the regulations. The main point is not to make the act too detailed and too extensive.

As said, the acts and the regulations apply to all entities involved. The options for individual considerations are limited. In the energy sector there is a need to make such individual considerations, for instance in connection with permissions to develop hydropower projects. Licensing is an appropriate tool for individual considerations. Some of the major issues to regulate by licensing are the following;

- shall the licence applied for be granted or rejected?
- decisions about the site, technical, physical and economical solutions
- rules of operations, measures to reduce inflicted damage, economic compensation to affected interests, and royalties

The individual conditions imposed to each licensee have to be laid down in the licence itself. Conditions concerning all licensees might be laid down in regulations. The principles and the framework for use of conditions in connection with licensing ought to be regulated by the act.

In some countries private investments in the energy sector are based on contracts between the developer and the state. These contracts also regulate conditions between the authorities and the investors. Issues regulate by these contracts must be separated from the conditions regulated by the licences.

How to compose the act is influenced by the use of other legislative tools. Therefore it is important to plan the provision of the total legal framework before starting to compose the act.

### **1.2.6 The energy act - political and institutional structure**

The political system which comprises the power and responsibility of Parliament and the Government, is usually regulated in the Constitution. In a parliamentary system Parliament is the legislative assembly,

while the Government is the executive authority of the political decisions laid down in the legislation. Provision of regulations is delegated to the Government. The enforcement of the legislation is carried out by the ministries and perhaps by a regulator, which are institutions responsible to the Government. Some exceptions from the distribution of power and responsibility mentioned, may be made. In Norway development of major hydropower projects have to be approved by Parliament, and the licences are granted by the Government. However, the Government and Parliament have no executive role related to licensing.

Upon formulating the provisions of an energy act, it is appropriate to plan the institutional structure in the energy sector and decide the power and main responsibility for each of the institutional levels.

The reliability, which is of great importance for private investors, is also affected by the organisation of the legal and the institutional structure. The most important principles and rules ought to be laid down in the acts, because changes of the acts are stronger politically controlled than changes of the regulations.

Reliability for entities in the electricity sector due to the legal framework, can not be ensured by the energy legislation alone. The total structure including the administrative law, the law of contracts and taxation law, is crucial for the private parties. The relations between the authorities and the private parties in general, could be appropriate to regulate by an administrative act. The possibilities for the authorities to change conditions imposed to licensees for instance, is a typical issue to regulate by administrative law.

In many countries legal system, changes of the Constitution require approval from a qualified majority in Parliament. In such systems, optimal reliability for protection of ones interests is obtained by regulating the major principles to protect private parties against encroachments from the authorities in the Constitution. One principle to be laid down in the Constitution could be that private property could not be nationalised without full economical compensation.

### **1.2.7 The sources of law**

The relevance of different sources of law varies according to the legal system and tradition in each country. In all countries regulating particular fields by acts, the words of an act are weighty. Yet the significance of the text of an act varies. In a tradition of law with limited possibilities for interpretation of the text by use of other sources, the extent of the acts has to be considerable. In other traditions the purposes of the act are important for the interpretation. The main source for these purposes is the proposal from the Government to the Parliament, including comments to each provision of the act. A tradition like that reduces the need for an extensive act.

Of course there is no possibility to change the legal tradition in a country in connection with providing new energy legislation. The point is that the existing legal tradition and technique have to be taken into account upon providing a new energy act.

There is also a link between the legal tradition and technique - and the reliability and transparency. A technique based on an extensive text of the act, undoubtedly superior to all other sources of law, reduces the uncertainty concerning the results of interpretation. To ensure confidence to a system which to a larger extent takes other sources of law into account, the rules of the interpretation and the other sources in question must be clearly set out and be easily accessible to ensure the transparency.

## **1.3 DIFFERENT ENERGY ACT STRUCTURES**

### **1.3.1 A summary of the decisions so far**

By making the decisions mentioned in the latter section, also the main structure of the energy act is decided. Therefore it will be appropriate to give a short summary of these main decisions, or at least issues considered before dealing with the more detailed alternative choices:

- shall an energy act apply to all sources of energy, or only to all kinds of utilisation of energy, or only to electricity?
- shall an act apply to generation of electricity «fuelled» by all kinds of sources?
- what kinds of operations in the electricity supply industry shall an act apply to?
- how shall the connection between the energy act and the water resources legislation be regulated?
- how shall the link to other acts be regulated?
- which different levels of law shall be used?
- the tradition of interpretation and sources of law have to be taken into account

### **1.3.2 The composition of an energy act**

Providing legislation is a dynamic process because the law always should fit in with the level of development of society. It is a continuous process. Therefore the legal framework may be quite fragmentary after some decades of development. Less developed countries often have the opportunity to provide the legislation in a sector almost from scratch. That is probably one reason for the main differences in the legal structure in the energy sector around the world, in addition to the varying legal traditions. Common law and civil law are the major traditions. Many countries also have a mixture of these traditions. Differences in local conditions concerning natural resources and priority of interests in conflict are also reasons for the variation of the energy acts.

Even though direct copying of law does not take place to any large extent, the energy law in most countries at an early stage of development, looks very much the same. There are several reasons for this, such as;

electricity is the same all over the world, the stage of development is about the same, the legal tradition or the mixture of traditions is the same, the major objectives are similar, the supply of natural resources is quite equal, considerations about the use of resources are common, environmental and legal requirements from investors, banks and donors are similar in many countries.

In the following some examples of composition of energy acts from different countries will illustrate similarities and differences;

# THE ELECTRICITY ACT OF ANGOLA

## **Chapter I: GENERAL PROVISIONS**

1. Scope
2. Definition
3. General principles
4. Electric power National Fund
5. Public Consultation
6. Security of installations
7. State of emergency
8. Civil and Criminal responsibility

## **Chapter II: PUBLIC ELECTRIC SYSTEM**

9. Establishment of the Public electric system
10. Management of the public electric system
11. Access to the public electric system
12. Consumers rights
13. Consumers duties
14. Contractual terms
15. Regulating Agency
16. Role by the local authorities

## **Chapter III: ON THE CONCESSION**

17. General provisions
18. Approval and granting of concessions
19. Duration of the concession
20. Reversal of the assets
21. Incentives
22. Concessionary rights
23. Concessionary duties
24. Suspension of the concessionary activity
25. Obligations arising from the suspension
26. Type of extinction
27. Termination of the contract
28. Withdrawal

## **Chapter IV: LICENCES**

29. Scope
30. Licence categories
31. Licence accumulation
32. Granting of licence
33. Duration of the licence
34. Licence holders rights
35. Licence holders duties
36. Reversal of assets
37. Suspension
38. Obligations arising from the suspension
39. Licence cancellation
40. Licence change and cancelling conditions

## **Chapter V: GENERAL SELLING CONDITIONS AND TARIFFS**

41. Tariff system
42. Consumption measurement
43. Tariffs under the concession domain
44. Changes, incorrect tariffs and reimbursement to consumers
45. Subsidies to consumers
46. Claims and indemnities
47. Tariffs under the regime of licence
48. Electric energy sale outside the public electric system - SEA
49. Imports and exports

## **Chapter VI: FINAL AND TEMPORARY PROVISIONS**

50. Relationship between the agents
51. Settlement of disputes
52. National Energy Plan
53. Consumption billing
54. Concessions and licences in force
55. Regulation
56. Interpretation and application
57. Legislative revoking
58. Law enter into force

# **THE ELECTRICITY ACT OF NEPAL.**

## **AN ACT MADE FOR THE MANAGEMENT AND DEVELOPMENT OF ELECTRICITY**

### O. Preamble

1. Short Title and Commencement
2. Definition
3. Survey, Generation, Transmission or distribution of electricity
4. Provisions of License
5. Terms of License
6. Restriction of the issuance of License
7. Matters to be observed by the Licensee
8. License may be cancelled
9. Agreement may be entered with the Licensee
10. Ownership of His Majesties Government
11. Royalty to be paid
12. Facilities relation to Income Tax and Other Tax and Charge'
13. Facility of Foreign Exchange
14. Facilities under Prevailing Law shall be enjoyed
15. Arrangement Relating to Housing and Bonus
16. Electricity Charge and other Charges to be realised
17. Assessment of Electricity Tariff and Other Charges
18. Separate Tariff and Other Charge may be assessed
19. Electricity Service may be stopped
20. National Transmission Line or Grid
21. Sale of Generated Electricity
22. Import and Export of Electricity
23. Fixing of Quality Standard of Electricity
24. No Substantial Adverse Effect be made on Environment
25. Volt Level and Other Technical Matters
26. Arrangements for Security Measures
27. Repair and Maintenance
28. Special Condition
29. No Nationalisation to be made
30. Purchase of Electricity Generation Plant etc
31. Security of Electricity Structure
32. To Enter Into Others Premises
33. Utilisation of Acquisition of Others Land and House
34. His Majesties Government may Generate and Develop Electricity
35. His Majesties Government may enter into Contract for Generation, Transmission or Distribution of Electricity
36. Hydro-electricity Development Unit
37. Appointment of Inspector
38. Penalties
39. Appeal
40. Power of Frame Rules

# THE ELECTRICITY ACT OF MOZAMBIQUE

(DRAFT, 1996)

O. Preamble

## Chapter I : GENERAL PROVISIONS

1. Definitions
2. Scope
3. Purposes
4. Sector organisation and policy
5. Power and authority

## Chapter II : NATIONAL ELECTRICITY COUNCIL.

6. Establishment of the National Electricity Council

## Chapter III : CONCESSION

7. Requirement of a concession
8. Exemption from concession
9. Application for a concession
10. Duration and content of a concession
11. Transfer of a concession
12. Administration of the national grid

## Chapter IV: OBLIGATIONS AND RIGHTS OF A CONCESSIONAIRE

13. Assets contributed by the Concessionaire
14. Specific obligations of the Concessionaire
15. Duty to supply electrical energy
16. Regularity of supply
17. Reduction or termination of supply
18. Electrical energy transit
19. Concessionaires access to installations
20. Application of rates (tariffs)
21. Termination of a concession
22. Indemnification
23. Reversion of assets and rights
24. Liability of the Concessionaire

## **Chapter V: FEES AND FISCAL REGIME**

- 25. Concession fee
- 26. Fiscal regime

## **Chapter VI: LAND USE AND EXPROPRIATION**

- 27. Right to land use and protection zones
- 28. Expropriation

## **Chapter VII: SAFETY AND ENVIRONMENTAL PROTECTION**

- 29. Safety and protection of assets and the environment
- 30. Safety measure

## **Chapter VIII: WORKS AND OPERATIONS**

- 31. Realisation of works and operations

## **Chapter IX: USE OF WATERCOURSES**

- 32. Access to, and use of, watercourses

## **Chapter X: CRIMES, INFRACTIONS AND SANCTIONS**

- 33. Theft and damages
- 34. Aggravated contempt
- 35. Other infractions
- 36. Procedures in the event of fraud
- 37. Sanctions

## **Chapter XI: FINAL AND TRANSITIONAL PROVISIONS**

- 38. Authority to issue regulations
- 39. Right to enter agreements with third parties
- 40. Acquired rights
- 41. Reservation of international obligations
- 42. International cooperation
- 43. Revocation of previous legislation
- 44. Entry in force

# **THE ENERGY ACT OF NORWAY**

## **AN ACT ON THE GENERATION, CONVERSION, TRANSMISSION, TRADING AND DISTRIBUTION OF ENERGY**

### **(UNOFFICIAL TRANSLATION)**

#### **Chapter I : GENERAL PROVISIONS**

- 1-1. Application
- 1-2. Purpose
- 1-3. Definitions
- 1-4. State-owned installations

#### **Chapter II : PROCEDURE**

- 2-1. Advance notice
- 2-2. Applications
- 2-3. Decisions

#### **Chapter III: ELECTRICAL INSTALLATIONS**

- 3-1. Concessions of installations
- 3-2. Regional concession
- 3-3. Mandatory delivery
- 3-4. Conditions
- 3-5. Expropriation of electrical installations

#### **Chapter IV: TRADE IN ELECTRICAL ENERGY**

- 4-1. Concession for trade in electrical energy
- 4-2. Exports and imports of electrical energy
- 4-3. Conditions

#### **Chapter V: DISTRICT HEATING INSTALLATIONS**

- 5-1. Concession for district heating
- 5-2. Conditions
- 5-3. Mandatory connection
- 5-4. Mandatory delivery
- 5-5. Prices
- 5-6. Closure

## **Chapter VI: PREPAREDNESS**

- 6-1. The Power Supply Preparedness Organisation
- 6-2. Decision-making powers
- 6-3. Safety measures
- 6-4. Orders
- 6-5. Distribution of expenditure and compensation
- 6-6. Mandatory notification
- 6-7. Fee to cover expenses

## **Chapter VII: MISCELLANEOUS PROVISIONS**

- 7-1. Monitoring
- 7-2. Deadlines
- 7-3. Non-compliance with conditions and orders
- 7-4. Changes of conditions
- 7-5. Penalties
- 7-6. Regulations

## **Chapter VIII: RELATION TO EARLIER LEGISLATION**

- 8-1. Entry into force. Amendments to other acts
- 8-2. Relation to earlier legislation
- 8-3. Amendments to other acts

### 1.3.3 Comments to the examples

In section 2 the main principles to be decided upon when formulating an energy act were dealt with. In the following some of these elements will be commented in relation to the examples.

#### 1. WHAT KINDS OF UTILISATION OF ENERGY?

Almost all the acts apply to electricity, and electricity only. The Norwegian energy act also applies to district heating «fuelled» by other sources than electricity. That is an example of how the local conditions affect the legislation. The climate and the infrastructure in Norway are the reasons for including district heating.

#### 2 .ELECTRICITY «FUELLED» BY ALL SOURCES?

All the acts apply to generation of electricity independent on which source is used. That is not necessarily specifically mentioned in the acts. But when generation of electricity in general is a part of the scope, and building and operation of electrical installations are subject to licensing, all kinds of electricity production are covered without any further specifications.

#### 3. WHAT KINDS OF OPERATIONS?

All the acts apply to generation, transmission, and distribution. Most of them also cover export and import. In addition, the Norwegian act regulates sales of electricity which reflects the free market of electricity in this country. Matters concerning safety, emergency planning, rationing and efficient use of electricity are regulated to a varying extent.

#### 4. THE LINK BETWEEN THE ENERGY ACT AND THE WATER RESOURCES LEGISLATION

It is difficult to comment this issue without proper knowledge of the water resources legislation in all the countries in question. But the connection between the energy act and the water resources act in Nepal and Norway can be commented.

To develop a hydropower project in Norway a licence for acquisition of the waterfalls and regulation of the watercourse is required pursuant to the water resources law. In addition licences for the electrical installations are required pursuant to the energy act. The application for the project is handled by the same authorities, but regulated by different acts.

In Nepal all kinds of utilisation of water is subject to licensing according to the water resources act, except for use for power generation which is regulated by the energy act. That is an example of a kind of «one-window-legislation». The investors do not need different licences granted pursuant to different acts.

#### 5. THE DIFFERENT LEVELS OF LEGISLATION

The extent of the acts mentioned is surprisingly equal, which means that the degree of details is about the same. A licensing system is introduced in all the acts. The acts are also based on being supplemented by regulations. Some of the acts regulate the use of contracts.

The use of contracts in connection with development of projects in this sector varies. In some countries the investors and the state enter into a contract which regulates different obligations and rights concerning the project. In Norway, watercourses are private property. Therefore acquisition of the waterfalls and land is an issue between the investors and the owners of these rights. If they are not able to obtain an agreement about the transfer of the rights in question, the authorities may grant a permission for expropriation. The licences regulate all the investors' obligations and rights imposed by the authorities.

## 6. THE INSTITUTIONAL STRUCTURE

In different ways the institutional structure, including power and responsibility for the different authorities, is regulated by the energy acts. Some of the acts strictly regulate the activities executed by the authorities, while others do not regulate these issues at all. This difference reflects two different legal traditions.

## 7. THE SOURCES OF LAW AFFECTING THE INTERPRETATION

In the Norwegian legal system, the Government's proposal of the act, including comments to each section, is an important source for interpretation of the acts. The purposes of the act, often expressed in a particular section, are also a source for interpretation. The Norwegian Energy Act is a result of such a system. That is the reasons for the limited extent of the act. Directly translated from Norwegian the energy act is called a «framework act», which means that only the main principles are regulated. The act is supplemented by regulations, but even the extent of regulations is limited. A system like that empowers the authorities enforcing this legislation, and is dependent on a well developed institutional framework with confidence from society.

The other energy acts are more detailed, which probably reflects a limited use of other legal sources for interpretation of these acts. That is probably an appropriate regulation concerning the participants requirements for reliability and transparency.

## **2. THE NORWEGIAN WATER RESOURCES LEGISLATION**

### **2.1 INTRODUCTION**

In this paper, the Norwegian water resources legislation will be dealt with. In this connection the expression «water resources» is confined to fresh water. Legislation in general has no importance isolated from its surroundings. Together with taxation and allocation of resources, legislation is the most important instrument for Parliament to carry its politics into effect. Therefore the law has to be contemplated in connection with the conditions in society, the political objectives and the measures chosen to obtain these objectives. The purpose of legislation is to make a legal basis for the measures implemented to obtain the political objectives.

This can be illustrated by a simple example. The political objective is to electrify the country. The country has got a potential of hydropower. Developing hydropower is decided to be one of the elements to obtain this objective. Then legislation has to be provided to prepare a legal basis for such a development. Elements in such a legal framework could be; rules of operation for the electricity supply industry, the executive authorities' power and responsibility in this sector, and issues related to ownership.

To get an appropriate background for the Norwegian water resources legislation, first the geographical and topographical conditions, and the main political choices concerning water resources will be described. The major part of this paper will consist of a description of the main principles of water resources legislation in general, the present water resources acts and a proposal for a new water resources act. Finally, the protection and master plans will be handled.

### **2.2 GEOGRAPHICAL AND TOPOGRAPHICAL CONDITIONS**

The area of Norway is 323 000 km<sup>2</sup>. It stretches from 58 degrees latitude to 71 degrees in a north-easterly direction in a length of 1700 km. About half the distance is north of the Arctic Circle. For such a northerly location, the climate is exceptionally warm, thanks to the Gulf Stream in the North Atlantic. The topography of the country is characterised by a mountain range of a height of 1000-2000 m along the full length of the relatively narrow country, cut across by valleys and fjords, widening to a more open landscape in the south east and a low mountain plateau in the far north.

Norway lies across the most frequent paths of Atlantic cyclones moving south-west to north-east on the boarder between temperate and arctic air masses, bringing moist air from more southerly areas. As most of the precipitation is generated by these cyclones, annual variations in precipitation depend primarily on the frequency of cyclone passages. There are also geographical variations of precipitation in the country caused by the mountain range which wrings out most precipitation on the western side, leaving a decreasing precipitation for the inland from the coast. The annual precipitation varies from less than 300 mm to more than 4000 mm in different parts of the country.

Totally, 450 000 lakes are registered in Norway. Such a large number of lakes are due to the influence of glaciers. Similar landscape exists in Alaska and in parts of Canada and New Zealand. The lakes are scattered over approximately 4000 watercourses. Almost 3000 of these have a length of more than 10

km or include lakes larger than 1 km<sup>2</sup>. Many of the lakes are located in the mountains. The characteristics of the rivers vary from long and gentle to short and steep.

## 2.3 UTILISATION OF WATER

Watercourses have been of great importance for the development of Norway, like for several other countries. A lot of settlements are linked to activities in connection with watercourses. Fishing, transport and navigation were the most important uses for several centuries. The invention of the water wheel about 1500 made it possible to take advantage of waterpower. This power was mainly used for saw and corn mills and to operate machineries in connection with mining. From the latter part of the 19th century electricity was generated by hydropower. This use of hydropower was fundamental for changing Norway from an agricultural to an industrialised country.

The use of water changes according to the development of society. Requirements for infrastructure, goods and production methods provide other kinds of use and priorities today. Today water supply through pipes is taken for granted in a developed country, and has got a high priority. In Norway almost all supply of drinking water is based on surface water. In addition to supply of households, the demand for water for animals in the agricultural sector and for process water for industry have to be covered. The utilisation of water for irrigation has also increased considerably the last decades, especially from the 1970s. Today 900 000 decares are supplied by installations for irrigation.

Farming of salmon and trout is a fairly new business in Norway. The farming of fish for food is to a large extent sited in the sea. But the smolt is farmed in fresh water, and these installations have a great demand for water. In 1995 there were 234 such installations with a total production of 140 millions of smolts.

In general, the nature in Norway is characterised by a moderate influence of human activity, which makes it attractive for recreation. Much of this recreation is exercised in connection with watercourses. Each year almost 1 million citizens use the watercourses for fishing. Paddling of canoes and rafting are other popular activities. These activities also attract foreign tourists to the country. Tourism is a priority area in Norway in general, and in some rural areas tourism is one of the most important trades.

Generation of electricity is undoubtedly the most important use of water economically. More than 99 % of the electricity produced in Norway is hydropower . That is exceptionally compared with other developed countries in the world. Because of the favourable natural conditions, generating this power is relatively cheap. Therefore hydropower has been, and still is, of great importance for the economics.

The runoff varies over the year. These variations are opposite to the seasonal variations of the demand for power. The runoff is at a minimum during the winter season when the electricity demand is at its highest due to heating and lighting. Thus it is crucial to store the water to generate the electricity at the time it is demanded. The numerous ice-caved lakes offer a generally favourable basis for the creation of storage, by damming to moderate heights and by tapping below the natural level. Sites for development of power plants spread all over the country reduce the need for transmission of the electricity. Such conditions provide a very favourable basis for developing an electricity supply industry based on hydropower .

About 118 Twh is now developed. The installed capacity is almost 28 000 MW. There are almost 600 power stations with a capacity over 1,0 MW. About 30 % of the total production is used by power-

intensive industries, such as metallurgical and wood processing industries. The rest of the production meets the demand from the service industry, from other kinds of industries and from households. Today the supply and the demand are balanced in an average year of precipitation. However, the demand for electricity is still increasing, and new projects will be developed. Due to economical and environmental considerations, the limit of development of hydropower in Norway is probably about 140 Twh.

The nature and the environment are affected by damming the lakes and by regulating the flow of water. Therefore the advantages of developing hydropower have to be carefully balanced against the environmentally damage.

## **2.4 WATER RESOURCES LEGISLATION IN GENERAL**

### **2.4.1 Political objectives**

As mentioned in the introduction, the purpose of legislation is to provide a legal basis to obtain political objectives. Some of the major political objectives in the water resources sector in Norway are:

- The management of the water resources shall ensure a sustainable development in this sector.
- The watercourses shall remain private property as opposed to most other countries in Europe and the rest of the world where the watercourses usually are public property.
- National control over the hydropower resources.
- A large extent of public ownership to power generation.

### **2.4.2 The legal boundaries**

The Norwegian water resources legislation is rather fragmentary. Some acts cover wide field, where use of the watercourses is one out of many aspects. The Act on Planning and Building is one of them. This act regulates permissions for construction of buildings and other land-use activities. But activities which are subject to licensing pursuant to water resources legislation do not require any permission from the building authorities. This act also regulates land-use in general. In this connection there are no exceptions for measures in watercourses. Therefore the planning authorities and the water resources authorities have to co-ordinate the enforcement of their respective legislation.

The act on pollution regulates all kinds of pollution, pollution of watercourses included. Some measures in the watercourses are therefore subject to permits from both the pollution authorities and the water resources authorities.

Some acts regulate specific use of water. Supply of drinking water is covered by regulations given pursuant to a general act on health affairs. There is also a separate act on salmonids and fresh water fish, enforced by the environmental authorities. Enforcement of these acts also requires cooperation with the water resources authorities.

An Act on Acquisition of Waterfalls is intended to meet the aforementioned political objectives about private ownership to watercourses, national control and public ownership to power generation. An Act on Regulation of Watercourses regulates the measures concerning construction and operation of

hydropower projects which involve consequences for the watercourses. However, all the operations from the electrical installation in the power plants to the electricity is received by the consumer are regulated by the Energy Act.

There is also a general Act on Water Resources. This act applies to all measures and projects in the watercourses which are not covered by any of the special acts mentioned. In addition, it often works side by side with the other acts.

To cover all the legislation related to the water resources into further details would have made this paper too extensive compared with the intentions. A selection has to be made. To give an appropriate overview of the legal framework regulating the most important uses of water and the tasks executed by the water resources authorities, this paper will concentrate on the hydropower legislation and the general Act on Water Resources.

### **2.4.3 The water resources authorities**

The acts are passed by Parliament and enforced by the Government through the ministries. The Ministry of Petroleum and Energy is the topmost executive authority for water resources affairs. The Ministry mainly handles cases of principle importance, while the directorate under the Ministry, The Norwegian Water Resources and Energy Directorate (NVE) handles most of the practical management. NVE also has the function of a regulator for the electricity supply industry.

NVE is the licensing authority for licences granted pursuant to the general Water Resources Act. For licensing of hydropower projects, NVE gives recommendations to the Ministry. After preparations from the Ministry, these licences are granted by the Government. The major projects, providing more than 20 000 theoretical horsepowers, have to be approved by Parliament.

All NVE-decisions affecting private parties can be appealed to the Ministry within 3 weeks. The parties affected can take the decisions taken by the Ministry to the courts of justice.

### **2.4.4 The levels of legislation - acts, regulations, licences and contracts**

The highest level of legislation is the acts passed by Parliament. Often the acts contain provisions which empower the Government to work out regulations to supplement the acts with further details. This is only to a limited extent practised in connection with the topical acts. No regulations are given pursuant to the Act on Acquisition of Waterfalls or the act on regulation of watercourses. Some regulations are issued pursuant to the water resources act.

Licensing is an important element of the regulation of the water resources sector. Developing hydropower projects and all other measures and activities which affect public interests to a certain extent, are subject to licensing. A licence is a permit from the authorities to develop a specific project or to run a certain business. An application for a licence can be granted, rejected, or granted on certain conditions. By using conditions, the authorities obtain the possibility to regulate the site, the technical, the physical and the economical solutions for a project, how to run the activity, to implement measures to reduce damage inflicted on the environment, and to establish a basis for economic compensation to interests affected.

In many countries the state enters into commercial contracts with developers of projects involving use of water. That is due to the public ownership to the watercourses. Such arrangements are not current in countries with private ownership to watercourses. In Norway acquisition of the rights needed to develop such projects is a matter between the owner of the rights and the developer. If the parties do not succeed to get an agreement, the authorities may opt to give the developer a permit for compulsory acquisition.

## 2.5 THE GENERAL WATER RESOURCES ACT

The general Water Resources Act applies to all projects and measures carried out in the watercourse itself and within a range of a few metres. Measures and projects in the rest of the catchment area which affect the watercourse, are covered by other acts, often the Act on Planning and Building. The act applies to both surface and ground water. The private ownership to the watercourses is the basis for many of the principles and rules laid down in the act. Public ownership would have required an other disposition of the legislation. The act contains both private and public law.

According to a basic principle of law, you can do whatever you wish on your own property. There can be no doubt that practising this principle in connection with watercourses would have provided unwanted effects to both private and public interests. Therefore exceptions from this principle are established in the act, on the one hand exceptions for the relations to other private parties and on the other hand exceptions for the relations to the public interests. The private ownership together with its limitations is essential.

Firstly about the exception relating to other private parties. Without an agreement or a right pursuant to any act, nobody may, even if it takes place on ones owns property, carry out any measure which brings risks or harm to others properties or rights. If an agreement is not obtained, a permit for compulsory acquisition from the authorities could be an option. To get such a permit, there has to be a provision for compulsory acquisition covering the current kind of project.

Breaches of this rule are sanctioned with a claim to restore the original situation. Whether a reversion is possible or not, damages can be claimed from the parties injured. Handling such cases with only private parties involved, is not a matter for the water resources authorities, but lies within the authority of the courts of justice.

The exceptions relating to the public interests are regulated by the system of licences. Without a licence, no encroachment upon the watercourse may take place, if it can be expected that the project may have a significant negative impact on public interests. Which encroachments that are subject to licensing are not listed in the act. All kinds of projects may be relevant, such as;

- aquaculture
- water supply
- irrigation
- dredging
- extraction of gravel
- construction of piers
- flood protection devices
- development of hydropower involving storage of water only to a limited extent

Characteristics of public interest are that they do not belong to any specific persons, and that it is impossible - or at least very difficult - to estimate their value. Examples of public interests are;

- nature conservation recreation
- tourism
- wildlife
- public water supply flood protection erosion protection
- safety of life and health

If any project subject to licensing is carried out without a licence, the authorities may require a reversion of the project, which may involve removal of installations. That could be a costly experience for the executor of the project. Therefore it is in the interest of executors to clarify the situation with the authorities prior to the start-up.

To clarify the situation, the executor has to send the plans for the project to NVE. The first considerations of whether the project can be significantly harmful for public interests, are carried out by the county governor, which is the state's representative in the counties. He prepares a recommendation to NVE. If NVE's conclusion involves that the public interests are not significantly harmed, the procedure is completed. The project can be carried out without any further licensing procedure and without any risks for sanctions from the authorities.

With an opposite conclusion, the licensing procedure is triggered. This procedure starts with an application accompanied by more detailed plans and an assessment of the impacts the project may have. A summary of the plans is announced in the local press. The process goes on with a consultation where the municipal and the county authorities, interest organisations and private parties affected, can give their comments.

A licence can only be granted if the benefits of the project for society are expected to exceed the disadvantages for the public interests. It is important to be aware of the fact that NVE only clarifies the current project in relation to the public interests. If the project involves harm on private interests, these conflicts must be solved by private law, and if necessary brought to the courts of justice.

In addition to the main principle mentioned, the Water Resources Act also contains provisions concerning specific topics, such as;

- borders between properties in watercourses
- private rights to extraction of water
- draining
- regulation of conflicts between land owners in connection with developing hydropower projects
- navigation
- safeguarding
- responsibility for installations
- close downs of installations to get rid of the responsibility
- compulsory acquisition
- applications, permits and compensation
- supervision of the watercourses

Because the purpose of this paper is to give an insight in the main principles of the act, it is not appropriate to deal with these topics into further details.

## **2.6 THE ACT ON ACQUISITION OF WATERFALLS**

The electrification of Norway started in the 1880s. A few years later investors also started buying waterfalls for developing hydropower for industrial purposes. At this time Norway was a rather poor country with lack of capital. Therefore, foreign investors were the most active in this field. After becoming an independent country in 1905, after several hundreds of years in a union, first with Denmark and later on with Sweden, the national identity was strong. It is also important to bear in mind that hydropower is an everlasting resource, as opposed to energy resources like petroleum and coal. Another point is that electricity supply is regarded as a part of the infrastructure of a country, which makes it appropriate for the authorities to regulate it differently from ordinary goods for consumption. These elements were the basis for providing an Act on Acquisition of Waterfalls to keep national control over the hydropower resources. The first act was passed in 1906. After some revisions, a final act was passed in 1917. This act has been amended in accordance with the development of society quite a few times, but the main principles and contents are still remained.

In addition to ensuring national control over the hydropower resources, the main purposes of the act are to provide the basis for a major public ownership to these resources, and to provide a legal basis for compensation from the power producers to the state and to the local authorities for utilisation of these natural resources.

Pursuant to the act, acquisition of ownership or the right to have the use of waterfalls which are expected to bring more than 1000 theoretical horsepower, is subject to licensing. The licensee is obliged to start the construction work within 5 years and has to start operating the power plant within another 5 years. To keep national control, the duration of a licence is maximum 60 years. After expiration of a licence, the waterfalls, including the power plants and other installations constructed in connection with power production, are transferred to the state without any compensation. The licensee is obliged to maintain the installations and they shall be in good shape when transferred. After reversion of the power plants, the state may keep them, or they could be sold to an appropriate buyer, often the original licensee.

The limitation of the licensing period does not apply to waterfalls owned by the state or Norwegian municipalities and counties, or waterfalls owned by companies where at least 2/3 of the capital is owned by such public entities. This discrimination makes publicly owned waterfalls more valuable than privately owned. Therefore this arrangement ensures, or at least in practice provides for, a major public ownership to power generation.

There are also rules in the act laying down a right of pre-emption for the state and the counties, when waterfalls are sold. If this right is used, the state or the county enters into the contract on the same conditions as the original buyer. In such situations, the state has got the first priority. If the state decides not to use this right, then the county gets the option to buy the waterfall. The right of pre-emption applies only the first time a waterfall is sold. If the right is not used that time, the right is lost. The principle of pre-emption makes it possible to provide both national control and public ownership in this sector.

A licence for acquisition of waterfalls includes certain conditions. Some of the most important conditions are an obligation to pay royalties to the state and to the municipalities involved, to yield power to the municipalities and to the county based on full cost, and to establish a business development

fund for the municipalities. In some situations, development of hydropower is only subject to licensing for regulation of the watercourse, because the developer already owns the water falls or because of the fact that public owned companies were excepted from the duty of licensing for acquisition of waterfalls up to 1969. In other situations, the developer is only subject to licensing for acquisition of the waterfalls because the project does not imply storage of water. Therefore both types of licences cover the conditions mentioned. In the situations where both the licences are required, the obligations pursuant to the acts are not doubled. These kinds of conditions will be dealt with further in connection with the Act on Regulation of Watercourses later on in this paper.

Not only acquisition of the waterfalls themselves are subject to licensing, but also acquisition of shares in companies owning waterfalls. If such acquisitions result in a stake for the buyer exceeding 20 %, it is subject to licensing. In such cases a simplified licensing procedure is practised, and usually the licensees will not get any conditions involving any serious consequences. However, acquisition of shares which results in a stake of more than 90 % triggers off a licensing procedure where a complete set of conditions is given. Changes of ownership in other ways than by acquisition are also subject to licensing. That includes chiefly mergers and reorganisations of companies owning waterfalls.

Until 1991 the distributors of power had a monopoly on selling power in their districts. When a free market of electricity was introduced by the energy act of 1991, a main purpose were to use competition to enforce a reduction of the number of utilities in the electricity supply sector and to encourage the utilities to act more business-oriented. To some extent these objectives are obtained. The result has been several mergers of power generating companies and reorganisation of utilities from municipally governed companies to limited companies.

At the time the Act on Acquisition of Waterfalls was prepared and passed, 1906-1917, the considerations were mainly linked to acquisition of waterfalls for developing new hydropower projects. Today most of the power potential is developed. Thus the common situations triggering off the licensing procedure nowadays, are acquisition of established power plants, mergers and reorganisation of power generating companies and acquisition of shares in such companies. In all these situations, usually a licence already exists. Therefore licensing in these situations is a matter of transferring existing licences. The conditions may be amended to the today's minimum standard pursuant to the act. Hydropower projects developed before 1917 were not subject to licensing and have obviously no conditions about reversion etc. To them it could be a great drawback to trigger the duty of licensing.

The disadvantages of being subject to licensing are to some extent a hindrance to obtain the purposes of mergers and reorganisations. Therefore the Ministry has been empowered to make exceptions from the duty of licensing on certain conditions in certain situations.

As mentioned, the act was established in an early phase of the electrification of the country and development of new hydropower projects was the main issue. Thus the act does not always cover the today's most current topics. That makes it necessary for the licensing authorities to interpret the act beyond its wording to an extent which reduces the legal transparency for the parties concerned. That illustrates the dynamic character of providing legislation. Legislation ought to be updated frequently according to the development of society.

From the start, the purpose of developing hydropower was public supply of electricity which was considered a task for the municipalities and the counties. The distribution utilities owned by the municipalities had a monopoly on sales of electricity in their districts pursuant to the energy legislation. Later on private-owned power-intensive industries started generating power for their own consumption.

In the 1920s, the state took a part in the development by producing power for bur. supply to both power intensive industries and to public supply. The political objectives in this sector enforced by the current legislation have resulted in the following structure of ownership to power generation:

- 50 % owned by municipalities/counties
- 35 % owned by the state
- 15 % owned by private companies

The abolition of the monopoly situation by introducing a free market of electricity in 1991, has increased the interest for private investments in power generation. However, the discrimination between private and public participants is an efficient hindrance for private stakes in each power producing company to exceed 1/3.

The main discrimination is against private enterprises in general. Private domestic and foreign enterprises are to a large extent treated equally. Even so, the foreign investors participating from the early phase of hydropower development have sold out almost all their stakes. Today, power generation is completely dominated by domestic ownership.

## **2.7 THE ACT ON REGULATION OF WATERCOURSES**

Regulation of watercourses for industrial and power generation purposes which is expected to increase the water power by more than 3000 theoretical horse powers for the whole watercourse, or by more than 500 horse powers for one or more waterfalls which can be developed together, is subject to licensing pursuant to the Act on Regulation of Watercourses. Also changes of existing installations for storage of water is subject to licensing. An application which includes both acquisition of waterfalls and regulation of the watercourse, is handled pursuant to both the acts and the permit will include the two needed licences. Conditions concerning ownership, reversion and rights of pre-emption are already dealt with in this paper. In connection with licences for storage of water, conditions concerning environmental impacts and compensation to the state and the local authorities will be treated. To prevent conflicts, and to ensure an optimal use of the hydropower resources, a licence for storage of water can only be transferred together with the right to use the waterfalls for power generation.

A licence for regulation of the watercourse, is a permission granted by the authorities to cause damage to the environment. A licence can only be granted if the advantages of the project exceed the damage. The core advantages are coverage of the demand for power for industrial and household use to reasonable prices, which is important for the welfare of the country.

The application procedure is rather complex. The procedure for projects with an average energy production less than 40 Gwh/year may be a bit simplified. The process usually takes 1-6 years, in average 3-4 years. The different phases in the process are:

- Notification of the project, including a proposal for Environmental Impact Assessment (EIA) programme.
- Consultations and public meetings concerning the notification.
- Determination of the EIA study programme.
- Application, including EIA-report.
- Consultations and public meetings concerning the application and the EIA-report.

- Approval of the EIA-report and an overall evaluation of the application.

The overall evaluation includes all the cost and benefit elements brought by the project. The decision may include a choice between different alternatives, a reduction of the project applied for, or the application may be rejected. However, the decision by the authorities can not bring an enlargement of the project compared with the application.

A licence contains a set of conditions, some of them can be met in connection with the construction of the project, other last for the whole licensing period. The major conditions concerning compensation are:

- Royalties to the municipalities affected and to the state.
- Yield of 10 % of the power generated to the municipalities/county based on full cost.
- Establishing a municipal business development fund.

There are also conditions to reduce the environmental impacts, for instance concerning:

- Approval of detailed construction plans regarding the landscape.
- Construction of weirs.
- Building fish ladders
- Clearing the regulation zone.
- Cultural heritage.
- Flood operation.

Rules of operation are also a part of the licence. Highest and lowest regulated water level permitted in the reservoirs has to be stated. In addition, seasonal variations in the aforementioned water level, by-pass water and minimum water flow at any place influenced by the regulation, may be stated.

Sometimes such restrictions are rather detailed. The rules of operation may be revised 30 years after the licence is granted.

The duration of the licence for the regulation is the same as for the licence for acquisition of the waterfalls in the current watercourse. Reversion of the power plants and the installations for storage of water, have to be synchronised to ensure these rights to be kept by the same holder.

For further details, a paper called «The licensing procedures for hydropower development in Norway» by Mr Knut Gakkestad, NVE, can be recommended.

## **2.8 PROTECTION AND MASTER PLANS**

### **2.8.1 Protection plans**

At the end of world war II in 1945, annual generation of power was 9,5 Twh. The main political objectives were to rebuild the country and to obtain further development, which included industrialisation and completion of the electrification. The rate of development of hydropower projects increased. In 1961 the annual power generation had reached 33 Twh. Environmental issues had no high priority during this period. In 1960, Parliament started discussing protection of watercourses. The purpose was to ensure a collection of non-developed watercourses. The first step was to get an overview

of the potential protection objects. A report applying to this issue was handled to Parliament in 1963.

The conflict between the authorities developing hydropower and the environmental interests reached a higher level about 1970. Thus the plans for protection were activated and worked out step by step. In the period 1973-1993, four protection plans were passed by Parliament. By these plans, 341 watercourses were protected against hydropower development. The plans cover a catchment area of 100000 km<sup>2</sup> and a power generation potential of 35 Twh/year.

The current watercourses are only protected against development of hydropower. Other kinds of projects may be permitted. Such projects are applied to by the licensing system pursuant to the Water Resources Act. The watercourses are protected because of their particular qualities. Thus the licensing evaluation is stricter for measures in these watercourses compared with non-protected watercourses.

### **2.8.2 Master plan**

A master plan takes in potential hydropower projects in watercourses which are not developed and not protected. In 1980 the preparation of a master plan started. The plan was passed by Parliament in 1986. It included all known potential projects over 5 Gwh/year. The plan included a ranking of the projects into three categories according to the extent of conflict. Later on some of the objects in category III were protected, while the rest were transferred to category II. Projects in category I may be applied for and licensed at once. Projects in category II may be licensed after the projects in category I are developed.

## **2.9 SOURCES**

Sources used for this paper are:

- Hydropower development in Norway, by Mr Vidkunn Hveding
- Elver og vann - vern av norske vassdrag, by Mr J.A. Eie, Mr P.E. Faugli, Mr J. Aabel
- NOU 1994: 12
- The licensing procedures for hydropower development, by Mr Knut Gakkestad, NVE
- Water licensing, by Mrs Gudrun Schneider, NVE

## **3. THE NORWEGIAN ENERGY ACT**

### **3.1 THE NORWEGIAN ELECTRICITY SUPPLY INDUSTRY**

The electrification of Norway started about 1880. To begin with, this was mainly a task for the local authorities. Later on private-owned industries and the state also participated in the development. However, these different entities got different roles. Local authorities had the responsibility for public supply, private-owned power-intensive industries generated power mainly for their own consumption, and the state handled bulk supply to both public supply and to the industry. Even if the distribution of electricity was a task for local authorities, the Government gave heavily financial support for carrying out the electrification, which was completed in the 1960s.

Because the municipalities were, and still is, responsible for distribution, the structure in this sector is very fragmentary. There are approximately 150 distribution utilities, many of them also generate power. There are also private-owned power generating companies and one power generating enterprise owned by the state, all together about 150 companies which deal with power generation in addition to other activities and about 30 pure generators. 50 % of the power generation is owned by the municipalities or the counties, 35 % by the state, and 15 % by private companies. An enterprise owned by the state runs the main grid.

### **3.2 THE LINK BETWEEN WATER RESOURCES AND ENERGY LEGISLATION**

Since more than 99 % of the power generated in Norway is hydropower, water resources and energy legislation are closely interlinked. The water resources legislation applies to all measures which have direct consequences for the watercourses, while the energy law regulates the operations from shaping the electrical installations in the power plants to the consumers receive the electricity.

The legislation in this sector in Norway has been developed step by step. Therefore it is probably more fragmentary than what would be optimal. There are three acts concerning water resources;

- an Act on Acquisition of Waterfalls
- an Act on Regulation of Watercourses
- a general Water Resources Act

Prior to the present energy act of 1991, the energy legislation was divided into five different acts. The different acts were as follows;

- an Act on Rationing of Electricity
- an Act on Emergency Planning
- an act, which among other issues, applied to the export and import of electricity
- an Act on Building and Operation of Electrical Installations
- an Act on Building and Operation of Installations for District Heating.

### **3.3 LICENSING IN GENERAL**

Norwegian water resources and energy legislation is very much based on a system of licences. Pursuant to the different acts mentioned, certain operations have been subject to licensing. An application for a licence can be rejected, it can be granted on certain conditions, or it may be granted without any conditions. This way the authorities can regulate the set-up, operation and ownership of projects and operations. They can also impose the licensee's different kinds of commitments towards private parties or towards the authorities, such as royalties to local authorities and the state or an obligation to sell a part of the power generated to the local municipalities based on full cost. Using licences to regulate the sector allows greater flexibility and individual considerations. It also implies delegation of power to the licensing authorities. The framework for their power and responsibility is laid down in acts and regulations. A broad framework provides these authorities with considerable discretionary power. The following operations were subject to licensing pursuant to the aforementioned energy acts;

- building and operation of installations for district heating
- building and operation of electrical installations
- distribution of electricity
- export and import of electricity

These acts are now replaced by the energy act of 1991, and the licences mentioned are transferred to the new act. Further characteristics of each of these licences will therefore be dealt with later on in this paper.

### **3.4 THE ACTUAL AND LEGAL SITUATION PRIOR TO THE ENERGY ACT OF 1991**

Prior to the energy act of 1991 the distribution utilities had both an obligation and a right to meet the demand for electricity in their district. They had monopoly on both sales and distribution. The utilities covered their need for power by own generation, by stakes in county generating utilities, or by bulk supply from the state power production enterprise. The tariffs were fixed by the local authorities and normally based on the principle of selling at cost. Since the costs differed, the distributors' tariffs varied over the country.

The main objectives of the Norwegian energy policy were;

- a rational use of the resources in this sector
- a high security of supply
- more approximated prices to the consumers all over the country

At the beginning of the 1980s the politicians found that these objectives were not satisfactory met. The rate of return on investments in this sector was unacceptably low compared with other sectors. The flaws could have been due to the fragmentary structure, to the monopolistic structure, or to the public ownership. Probably the shortcomings were due to a combination of all three components. To obtain the above mentioned objectives for the electricity policy the following elements were of importance;

- to prevent overinvestment and surplus generating capacity
- to develop the most favourable projects before the less favourable from a national perspective
- to rationalise the structure of this sector by reducing the number of utilities
- to improve the efficiency of the utilities
- to increase flexibility in the consumption of electricity according to the volume of the water inflow.

During the 1980s an advisory legal committee and The Ministry of Petroleum and Energy hammered out two alternatives;

1. To restructure the sector to 20 vertically integrated utilities with a monopoly on supply in their districts. Vertically integrated means that production, transmission, distribution and sales are carried out by the same utility.
2. To introduce a free market for electricity without enforcing any changes in the structure.

The latter alternative was chosen.

A free market with prices dependent on supply and demand was intended to bring a proper allocation of resources from a socio-economic perspective. In countries having well-developed electricity supply industry with capacity to meet the existing demand of power, introducing a market may be used as a driving force to improve the utilisation of the resources. Introduction of a market is not applicable in an early phase of electrification of a country.

Running a network is a natural monopoly because it will be socio-economic unprofitable to build competitive networks. Therefore producers and traders in electricity are dependent on using these monopoly services to supply their customers. In addition, many distributors also are producers and/or buyers and sellers of power. These elements make for a special market. To create an efficient market, it is important that there are regulations preventing the network operators from taking unreasonable advantage of their positions as monopolists. Another important element in the policy is the retention of public ownership in the sector. Therefore, it is a free market of electricity where the participants to a large extent are public utilities.

## **3.5 THE ENERGY ACT OF 1991**

### **3.5.1 Background**

In 1991 the new Energy Act entered into force to provide a legal basis for the free electricity market. This basis was mainly formed by two elements; the distributors' former obligation and right to meet the demand for electricity in their districts were replaced by an obligation to connect all customers, both producers and consumers, physically to the networks and an obligation to provide the customers a contractual access to the market. In addition an electricity trade licence was introduced, mainly to regulate the network monopolies. The preparation of a new Energy Act also resulted in a more transparent legislation. The five existing energy acts with their licensing systems were incorporated in the new act.

As mentioned, the Norwegian energy legislation is largely based upon regulating by licensing. More

precisely by the authorities' opportunity to reject applications and or to impose conditions in connection with granting licences. The Energy Act itself contains provisions on what kind of conditions may or shall be imposed. In the regulations conditions applying to all licensees are laid down. The licensees are obliged to follow such guidelines. In addition, conditions are laid down in the licensees' individual licences.

The Norwegian Water Resources and Energy Directorate (NVE), a directorate responsible to the Ministry of Petroleum and Energy (MPE), is the executive authority for all types of licences pursuant to the Energy Act, except for export/import licences which are handled by the MPE. NVE is also empowered to issue more detailed regulations. All decisions made by NVE concerning private parties may be appealed to MPE.

In the following the main principles of the Energy Act will be dealt with.

### **3.5.2 General provisions**

The act is applicable to all generation, transformation, transmission, distribution and sale of electrical energy in the territory of Norway, and on the export of such energy out of, or import into Norway. It is also applicable to production of thermal energy for district heating.

The objective of the act is laid down in a separate clause. The act is intended to ensure that the generation, transformation, transmission, distribution and sale of electrical energy are rationally carried out for the benefit of society, having regard to the public and private interests affected.

The Energy Act is rather general. It provides a framework for the energy authorities, without regulating into detail which aspects to take into consideration when enforcing the act. Therefore the objectives of the act are of great importance for the interpretation of different clauses in the act.

### **3.5.3 Licensing of electrical installations**

#### **3.5.3.1 Electrical installations**

No facility for generation, transformation, transmission or distribution of electric power may be built or operated, neither may such facility be materially changed or expanded, without prior licence under this act. This obligation applies to installations with a voltage over 1000 V alternating current / 1500 V direct current.

After having received the application, the authorities first have to consider whether the installation in question is needed or not. Socio-economical and technical considerations are central in this phase. The authorities will not allow an overinvestment. Environmental aspects are also weighted already at this stage. Even if environmental values are difficult to express in economic figures, the environmental costs may nevertheless be so large that they outweigh the advantages of an installation. However, often there is no doubt about the necessity of the installation, the question is how and where to build it.

If the conclusion is positive, the next step is to decide the site and the technical framing of the

installation applied. Transmission lines are probably the most controversial installations in question. In these cases, there is usually more than one possible trace. There are also different technical alternative as overhead lines, underground cables, and sometimes also sea cables. In such cases, economical and technical considerations have to be balanced against environmental considerations.

### **3.5.3.2 Area licence**

The distributors' area licences simplify the licensing system for electrical installations. The area licence permits the distributors to build and operate electrical installations up to 22 kV without a licence for each particular installation, within a defined area.

The area licensee has an obligation of delivery of electricity within their area. This obligation is composed by two elements. The licensee is obliged to give all existing and new customers, both producers and consumers, physical access to the networks. There is also an obligation to ensure the end-users contractual access to the market. This obligation may be met by selling electricity itself, by establishing contact with another trader or by passing on power traded in the spot market at the electricity exchange. This obligation has to be met only in special situations where the customer is not able to find a supplier by himself. In the existing electricity market, such a situation is not very practical. The area licensee also has the responsibility for the security of supply within the district.

### **3.5.3.3 Licence of installations for district heating**

This licensing system is similar to the system for licensing of other electrical installations. The socio-economical and technical considerations are of great importance. Since such installations mainly are current in urbanised areas, the environmental consequences of this installation are less central compared with the consequences of building transmission lines.

To ensure the economical basis for investments concerning such installations, consumers may be obliged to be connected to the district heating system by decision of the municipal authorities. To prevent the supplier to take unreasonable advantage of his monopoly position, the tariffs are regulated. Conflicts concerning tariffs or terms may be brought to the licensing authorities for a decision.

### **3.5.4 The electricity trade licence**

The electricity trade licence is the main legal instrument for regulating the free market of electricity. In connection with this licence, it is important to have the characteristics of this market in mind. All traders in electricity are dependent on the network monopoly for transportation of their goods. Most of these monopoly utilities also participate in the electricity market, thus in this market they compete with the buyers of their network services. Therefore regulating an electricity market is mainly about regulating the network monopoly.

Pursuant to the Energy Act, the purposes of the trade licence are to ensure the interests of the network customers, which includes producers, traders and end-users by;

- ensuring an economically rational trade of electricity in an efficient market

- monitoring the networks operations as a natural monopoly

The trade licence applies to all kinds of sales of electricity and network services. The basis for detailed regulation and monitoring of the market is laid down in conditions given to the licensees.

The most important principles underlying these conditions are;

- network -owners are obliged to provide access to the network to all buyers and sellers of electricity
- no discrimination between buyers of network services is permitted
- network charges are independent of the transport distance

Another purpose of this licence is to regulate the monopolists' profit and to prepare a basis for such a control. To make this control possible the vertically integrated utilities are obliged to keep separate accounts for operations exposed to competition and monopoly operations.

Profit control of monopolies is a complicated topic, and may be regulated different ways. Up to 1997, a cost of service regulation was practised. The utilities were allowed to cover all their costs, plus a maximum rate of return which was fixed by the authorities. This kind of regulation, however, does not give any incentives to increase the efficiency of the utilities. In 1997, an incentive-based regulation was therefore introduced. According to this regulation an income cap of each utility is fixed. By cutting costs, the utility will increase profit. The authorities fix a minimum and a maximum rate of return. The utilities are allowed to keep all the profit made by cutting costs, within the limitation of the maximum rate of return of 20 % p.a. The minimum rate of return is 2 % p.a.. The income cap will be reduced by 1,5 % each year to enforce the progress of efficiency. In addition, a larger reduction of the income cap can be imposed according to an individual consideration of each utility. The licensees are obliged to give different kinds of technical and economical information to the authorities to make this regulation possible.

To ensure a proper level of maintenance and new investments, an arrangement for compensation for non-delivered energy by interruptions is introduced. This means that the distributors have to compensate end-users for non-delivered energy according to rates fixed by NVE.

NVE has the authority to instruct the utilities to change their tariffs or terms of contracts in accordance to regulations for calculation of network charges. The parties involved may also bring disputes concerning calculation of network charges to the authorities for a decision.

### **3.5.5 Export / import**

Export and import of electrical energy are subject to licensing. The most current considerations in connection with applications for such licences are technical and economical matters, security of supply, optimal exploitation of the resources and environmental matters.

In Norway, more than 99 % of the electricity generated is hydropower . In this system, the installed capacity is considerable, and the production is very flexible. At the same time supply of hydropower is dependent on the precipitation. The quantity of precipitation in Norway fluctuates plus/minus 20 % compared with the annual average. Investments in generation capacity meeting the demand even in the

driest years, would not be socio-economically profitable. Therefore lack of precipitation in a hydropower system may lead to shortage of power, which may lead to rationing.

On the continent most of the electricity is generated by oil, gas and coal. Such a system is not vulnerable in the same way. In the meantime, it is neither very flexible. The production cannot be varied in accordance with short-term variations in the demand for power, thus it would be profitable to supplement with hydropower in periods with high demand. By interlinking the two systems, it is possible to take advantage of the combination of each system's particular qualities.

Three sea cables between Norway and Denmark exist. In addition, sea cables between Norway and Germany and Netherlands are licensed, but not yet built. The state-owned power production enterprise, Statkraft, has a central position on the Norwegian side, while other big power producers are involved in the other end.

In the Swedish electricity supply industry, which is interlinked with the Norwegian by transmission lines, the electricity is mainly nuclear and hydropower .

### **3.5.6 The electricity exchange**

In 1993, an electricity exchange was established. In 1996, Sweden joined this exchange and Sweden and Norway then got a common market. Later, Finland and Denmark have also joined this market. The exchange operates two different markets. It has a daily market for physical delivery the day after the transaction is done, called the spot market. It has also a market for delivery of electricity within three years into the future. The market is organised like a future market without physically delivery. It is a financial market where the contracts are settled daily in accordance with the price in the spot market.

Statnett, the system operator and dispatcher, operates an imbalance market used to balance out the momentary gap between production and consumption. This is of course a physical market.

### **3.5.7 Mergers of utilities**

Rationalisation of the structure of the electricity supply industry was one of the important objectives of introducing the free market. However, the Energy Act has no instruments against the licensees to enforce changes in the structure.

A vertically integrated organisation of the utilities is by the authorities not considered as optimal to obtain an efficient electricity market. With such an organisation there are possibilities to cross subsidise between the monopoly operations and operations exposed to competition. It will also reduce the volume in the wholesale market. Furthermore, production, sales, and network businesses require different kinds of objectives and strategies. Might be 5-10 sales utilities, each covering the whole country, is enough to obtain a satisfactory competition and a rational structure, while the number of distribution utilities probably ought to be higher. A mixed distribution and sales utility sending one bill to the end-users including both the power and the transportation costs, does neither promote the customers consciousness of the electricity market and the difference between buying network services and power.

The energy act has no prohibition against new vertical integrations, nor any provision to require splitting the existing vertically integrated utilities. But acquisition of enterprises involved in operations due to

licensing, requires a new licence, and thereby empowers the authorities to prevent an unwanted development of the structure.

Horizontal integrations are usually considered as favourable from the authorities point of view. By such integrations, a more rational structure without an increasing interlinking of production, sales, and distribution will be obtained. Several mergers applied for after the energy act entered into force, have involved existing vertically integrated companies buying distribution utilities. These mergers result in a rationalisation of the structure and an increasing extent of vertically integration at the same time. These elements have to be balanced against each other in the authorities' considerations.

A principle solution made by the authorities, is to allow such mergers, provided that the purchaser separates the different kinds of business operations in different entities. A minimum degree of separation is to organise these entities in a concern with production, sales, and distribution placed in separate subsidiaries under a holding company. In addition, some special conditions are laid down in the licences to increase the extent of separation between the entities compared with ordinary concerns.

### **3.5.8 Rationing**

Rationing is particularly current in connection with technical breakdowns and lack of precipitation in a hydropower system. The Ministry of Petroleum and Energy is empowered to carry rationing into effect, while NVE is the executive authority. Three conditions have to be present before this power may be used;

- extraordinary conditions are present
- these extraordinary conditions have lead to - or may lead to - lack of electricity
- rationing is necessary to ensure optimal use of electricity

Carrying out rationing will result in a compulsory reduction in supply and use of electricity. The rationing may be carried out by assignment of quotas to producers and consumers, by periodic interruption of supply, by prohibition of use of electricity to particular purposes, or by cancelling contracts which lead to lavishment of electricity.

### **3.5.9 Contingency planning**

NVE may give instructions on safety measures to prevent damage to electricity supply installations, especially to dams. The utilities are obliged to effectuate the instructions without any compensations for the costs.

In emergency situations and during wartime, the electricity supply industry will be subject to an emergency organisation where the utilities will be incorporated. However, NVE will co-ordinate the contingency planning and have the management of the electricity supply of the country in such situations.

### 3.6 EXPERIENCES BY INTRODUCING A FREE MARKET OF ELECTRICITY

To which extent are the objectives of the Norwegian energy policy obtained by introducing a free market of electricity? This question has no exact answer, but it is possible to give some indications of the development so far.

A large part of the total volume of electricity is handled by the power exchange. The rest is traded bilaterally. The prices at the exchange are also often used as a reference in the bilateral contracts. Therefore the prices in the market to a considerable extent reflect the relation between the supply and demand for electricity. Thus the geographical variations of prices have been reduced.

The big consumers are rather active in the market. They do not accept non-competitive terms offered by the local distributor and supplier. Ordinary household consumers are some less active. One of the reasons is lack of information and consciousness about the market. Up to 1997, consumers had to pay a fee for changing supplier. This probably delayed the development. In 1997, this fee was abolished and the information from the authorities and the press has increased. Later, also household consumers have become much more active in the market step by step.

Almost nothing happened with the structure in the sector up to 1996. This situation changed in the latter half of 1996, partly as an unintended result of changes in the tax legislation. But probably the sector was mature for changes anyhow, and the trend seems to continue. Since 1996, the number of mergers have increased, and up to 2003 the number of distribution utilities has been reduced from more than 200 to about 150. In addition, a large number of utilities have been reorganised from municipal enterprises to limited companies to become more business-oriented. However, the heavy extent of public ownership in the sector is maintained

The development of efficiency for the network utilities has been investigated for the period 1997-2001 (the first period with incentive based regulation). It shows that the utilities have increased their efficiency according to the authorities' intentions. The efficiency has annually increased 2-2,5 %.

Consumption has increased steadily the latest years. The generation capacity has not increased much in the same period. Thus there is no overcapacity anymore. In the present situation, Norway has to import 6-7 Twh in an average year. One of the shortcomings with a well functioning free market of electricity is that it does not seem to give incentives for investments in additional generation capacity.

The Norwegian electricity supply industry is a sector with long traditions. Turning from monopoly to competition was a dramatic change. The implementation of the new regime requires a change in mentality for all parties involved, which necessarily takes a long time. The market was immature for several years after the introduction in 1991. However, this has changed the later years, and today in 2003 it seems that we have a well functioning market. The political objectives which formed the basis for the introduction of the market seem to a great extent to have been met.

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