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## Changing currents in Norwegian hydropower governance?

The challenge of reconciling conflicting interests

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# Report

## Changing currents in Norwegian hydropower governance?

The challenge of reconciling conflicting interests

A report written within the GOVREP project (Governance for Renewable Electricity Production), part of CEDREN (Centre for Environmental Design of Renewable Energy)

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### ABSTRACT

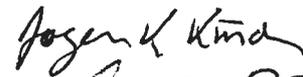
The present report focuses on the potential for reconciling energy and environmental policy concerns when phasing in new renewable electricity production. In order to identify the potential for a better reconciliation for Norwegian hydropower, the report assesses the governance of the sector, focusing on the licensing of hydropower production along two dimensions: (1) horizontally, looking at the level of governance related to the degree of coordination between relevant policy domains and sectors – with related objectives, plans and regulations, as well as interests, actors and institutions; and (2) vertically, focusing on the interaction between different levels of governance (international/national/regional/local). In addition, perspectives from research and documentation of assumed effects and impacts of hydropower will also be viewed as a crucial part of the licensing processes.

In sum, main political and regulatory drivers and barriers impacting upon the current and future hydropower development in Norway are quite complex and fragmentary, and there is currently no overall target providing a general direction for hydropower development. Given the lack of an overall, coherent approach, the interaction between the different levels of governance does not demonstrate a specific, coherent pattern. At the same time the interest for further expansion of hydropower production is growing. Knowledge and documentation stand out as crucial in two major ways: (1) A need to reinforce the accessibility and transparency of the licensing process; and (2) complementary and updated research and documentation on how to meet the challenges raised by the renewed interest in, and further demand for, hydropower.

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## 1 Sammendrag

Denne rapporten inngår i forskningsprosjektet GOVREP (Governance for renewable electricity production). Formålet med GOVREP er å gi konkrete innspill til hvordan man kan forene energi- og miljøpolitiske hensyn i Norge på en bedre måte enn hva som er tilfelle i dag. For å oppnå dette er det viktig å evaluere graden av koordinering mellom relevante politikkområder og sektorer, som hver seg har forskjellige mål, planer og reguleringer, så vel som interesser, aktører og institusjoner.

I denne rapporten tas det utgangspunkt i konsesjonsprosessen knyttet til vannkraft. Det fokuseres på de generelle trekkene ved det formelle rammeverket, og hvordan ulike interesser og hensyn er koordinert i forhold til det nasjonale, regionale og lokale nivået. Gjennom å kombinere en slik overordnet nasjonal tilnærming – som eksemplifiseres gjennom denne rapporten med analyser av konkrete vannkraftsaker (Egeland og Jacobsen 2011), søker GOVREP-prosjektet å synliggjøre hvordan det formelle rammeverket samhandler med og påvirker vannkraftprosjekter.

I rapporten skilles det mellom realisering av ny vannkraftproduksjon (både stor og liten skala) og endring av etablerte anlegg (både oppgradering/utvidelse (O/U), og revisjon). Grunnet konsesjonsprosessens fokus på kunnskap og dokumentasjon som en helt sentral faktor for regulering og konsesjon, har kunnskapsgrunnlagets rolle et spesielt fokus i rapporten.

Rapporten fokuserer på to problemstillinger:

- I hvilken grad, og hvordan er forskjellige hensyn, mål og interesser koordinert i forhold til vannkraftprosjekter i Norge?
- I hvilken grad, og hvordan koordineres energi- og miljømål på tvers av styringsnivåer?

Det fins klare politiske og økonomiske interesser som ønsker å øke vannkraftproduksjon i Norge. Samtidig mangler det en overordnet målsetting og klare prioriteringer for videre utvikling av vannkraften. Det er for eksempel ikke avklart politisk hvorvidt vannkraften skal bidra til måloppnåelse av norske klimaforpliktelser. Det er heller ikke blitt foretatt en politisk avklaring av vannkraftens rolle i et europeisk perspektiv, til tross for at EUs fornybardirektiv snart skal implementeres og sett i lys av den økende interessen for Norge som 'grønt batteri' for Europa. I forlengelsen av dette fins det også en manglende avklaring knyttet til vannkraftens rolle for verdiskaping og næringsutvikling nasjonalt. Det nærmeste man har kommet er et strategisk rammeverk for vannkraft: "Samlet plan". Som et styringsinstrument er imidlertid ikke Samlet plan tilpasset dagens energipolitiske landskap, og det eksisterer heller ikke et helhetlig energipolitisk rammeverk som dette kan integreres i. Av denne grunn finnes det ikke noen enkel og klar måte å knytte det overordnede strategiske nivået til konkrete prosjekt.

Det etablerte formelle rammeverket og prosedyrene for vannkraftkonsesjoner krever at avveiningen av relevante hensyn og interesser gjennomføres fra sak-til-sak. Regelverk og relevante regulativer resulterer i flere sjekkpunkter og formelle krav. Samtidig er konsesjonsprosessen tydelig preget av den saksspesifikke tilnærmingen. Basert på denne praksisen finnes det ikke noe klart svar på hva som utgjør et ideelt vannkraftprosjekt ut fra generelle kriterier. Sak-til-sak-tilnærmingen er et karakteristisk trekk ved styringssystemet for vannkraft i Norge og er nedfelt i det juridiske rammeverket for konsesjonssaker. Samtidig må konsesjonsmyndighetene også inkludere overordnede mål og hensyn fastsatt i lovverket. Dette skaper utfordringer når avveininger knyttet til de enkelte vannkraftprosjekter foretas.

I tillegg til utfordringer knyttet til den saksspesifikke tilnærmingen, er det også en utfordring knyttet til koordineringen mellom ansvarlige departement og etater på energi- og miljøområdet.

Oppfølgingen av vanddirektivet i Norge er en klar illustrasjon på disse utfordringene. Oppfølgingen har vist at de etablerte mandatene og rollene til de relevante myndighetene, det vil si "OED-segmentet" vis-à-vis i særdeleshet "MD-segmentet", er svært preget av etablert praksis. Dette har skapt en stivhengighet.'

Ansvar for utformingen av avbøtende tiltak har i forbindelse med oppfølgingen av vanddirektivet blitt delegert energimyndighetene. Sammen med regjeringens beslutning om å behandle miljøhensyn innenfor rammen av det enkelte vannkraftprosjekt i konsesjonsprosessen, der man kun er "informert" om regionale vannforvaltningsplaner, forsterker dette inntrykket av at oppfølgingen av vanddirektivet følger etablerte, institusjonelle mønstre.

Strukturen til offentlige etater og deres mandater har også tydelig innvirkning på konsesjonsprosessen og hvilke mål som vinner frem, ikke minst på bakgrunn av at det finnes få overordnede retningslinjer om hvilke prioriteringer som bør tas. Sak-til-sak tilnærmingen synes derfor å være en robust del av den etablerte styringen av vannkraftsektoren. Situasjonen innebærer økte krav til effektive endringer i lys av fundamentale eksisterende og fremtidige energipolitiske spørsmål. Et eksempel på en slik utfordring er det faktum at enkelte miljøhensyn er knyttet til økonomiske interesser i større grad enn andre, og dermed blir *miljøinteresser*. Dette er i økende grad tilfelle med klimaendringene i et større, internasjonalt perspektiv (økt kraftproduksjon for et europeisk marked med tilhørende økt inntekt for kraftprodusenter). Et annet eksempel er vannkraftproduksjon i lakseførende vassdrag hvor ulike miljømål ofte kommer i konflikt (se Egeland og Jacobsen 2011). Slike kryssende problemstillinger utgjør også en utfordring på lokalt nivå, hvor kommunen foretar en avveining mellom ulike hensyn og interesser når det tas stilling til ulike vannkraftprosjekter. Denne avveiningen vil i noen tilfeller også påvirkes av kommunens aksjonærinteresser i vannkraftselskapet. Et lignende dilemma, men som i mindre grad har vært oppe til diskusjon, eksisterer også på nasjonalt nivå på bakgrunn av at staten innehar flere roller samtidig: som eier av produksjonskapasitet; eier av sentralnettet; og i tillegg som eier av en stor del av regionalnettet. På samme tid er staten konsesjonsmyndighet. For større vannkraftprosjekter, kan en avsluttende politisk prosess i Stortinget åpne for en bredere debatt om slike ulike interesser. Vedtak på politisk nivå innebærer imidlertid ofte mindre forutsigbarhet og større inkonsistens i konsesjonsbehandlingen. Det er ikke uvanlig at sentrale avveininger som allerede er gjennomført av NVE i konsesjonsprosessen blir påvirket av nye hensyn som kommer til overflaten i den politiske debatten.

Ser man på styringsutfordringenes vertikale dimensjon, påvirker det internasjonale nivået i økende grad norsk vannkraftforvaltning både på miljø- og energipolitiske prioriteringer. Foreløpig påvirker imidlertid miljøsidens norsk vannkraft mer indirekte enn direkte. For det første er miljøpolitiske mål for biologisk mangfold og laks knyttet til oppfølging av internasjonale forpliktelser. Videre er oppfølgingen av EUs vanddirektiv og den regionale vannkraftforvaltningen ment å samvirke og resultere i innspill til vurderingen av vannkraftkonsesjoner og vilkårsrevisjoner. Dette har imidlertid til nå skjedd i begrenset grad. Foreløpig er imidlertid den mest direkte og konkrete sammenhengen mellom det internasjonale nivået og norsk vannkraft knyttet til integreringen av vannkraften i et nordisk marked, med sine forgreninger til et større europeisk marked som er under utvikling. En side ved dette, som det behøves mer kunnskap om, er etterspørselen etter norsk vannkraft som en balanserende faktor for vind- og solenergiproduksjon i Europa. Foreløpig er dette en mulighet som mest diskuteres i deler av energibransjen og blant enkelte politikere, og det fins på dette tidspunkt ingen konkrete politiske strategier med klare politiske mål. Norge som 'grønt batteri' for Europa vil potensielt bidra til å realisere industrielle ambisjoner, samtidig som det kan forenes med klimapolitiske hensyn og styrke forsynings situasjonen både i Norge og i Europa. Enkelte av disse prosjektene vil imidlertid føre med seg hyppigere svingninger i vannstand og derigjennom kunne komme i konflikt med et forsterket fokus på mer bærekraftig vannforvaltning og en sterkere ivaretagelse av biotoper og landskap påvirket av vannkraft. Her eksisterer det imidlertid fortsatt begrenset med dokumentasjon, både knyttet til lokale effekter, og i forhold til relaterte konsekvenser på energisystemet og markedet på nasjonalt og europeisk nivå. Med flere miljøkrav initiert på det internasjonale nivået, og med en mer sammensatt internasjonal miljøpolitisk agenda, kan miljømessige hensyn, relaterte mål, og interesser oppnå større legitimitet og (i hvert fall indirekte) mer innflytelse i konsesjonsprosessen for vannkraft. Samtidig risikerer man også flere interessekonflikter mellom ulike miljøpolitiske mål (i hovedsak klima vs. biologisk mangfold) dersom ingen nye, generelle avveininger og prioriteringer blir gjort på nasjonalt nivå.

Ved vurderingen av det internasjonale nivået sett i forhold til det nasjonale nivået, er det viktig å påpeke at dette samspillet ikke nødvendigvis følger et strengt hierarkisk mønster. Et eksempel på en mindre hierarkisk bundet kobling kan bli den nye forbindelsen mellom EU og det regionale nivå i oppfølgingen av EUs vanddirektiv. Selv om de regionale planene er formulert i en nasjonal sammenheng og skal godkjennes av nasjonale myndigheter, kan det regionale nivået i økende grad bli påvirket av utviklingen på europeisk nivå. I tillegg kan en eventuell standardisering av kunnskap og krav til dokumentasjon initiert på EU-nivå påvirke regionale aktørers oppfølging av vannforvaltningsplaner. Et eksempel på dette er at Landssamanslutninga av Vasskraftkommunar (LVK), sammen med andre frivillige organisasjoner som representerer miljø -og fritidsinteresser, har klaget den norske oppfølgingen av vanddirektivet inn til EFTAs overvåkningsorgan ESA (LVK et. al 2011.) LVK hevder at regjeringens beslutning om å angi miljøstandarder for vannkraft gjennom konsesjonsprosessen, i stedet for å sette miljømål som en del av den regionale vannkraftforvaltningen - og dermed kreve at konsesjonsmyndighetene følger opp enkeltsaker – strider mot direktivet (ibid.). Dersom ESA mener at LVK har en god sak, kan resultatet bli at norske myndigheter må endre sin eksisterende tilnærming. Vi risikerer i så fall en økende grad av konflikter mellom ulike interesser på tvers av styringsnivåer. Aktører på både nasjonalt og lokalt nivå er kritiske mot utsiktene til en sterkere integrering av norsk vannkraft i et europeisk energisystem. Noen frykter at dette vil føre til flere ulemper for kommuner gjennom større svingninger i vannstanden (LVK 2009). Samtidig frykter kommunene at de ikke vil bli tilstrekkelig kompensert, så lenge det ikke tas høyde for tilleggsinntekter fra økt eksport i konsesjonsavgifter, næringsfond og andre tradisjonelle inntektskilder for kommunene (ibid.). Samtidig får imidlertid mange kommuner inntekter fra økt produksjon gjennom sine eierandeler i vannkraftproduserende selskaper.

I tillegg til potensialet for pumpekraft illustrerer også opprustning og utvidelse av vannkraftverk (O/U) dynamikken mellom det nasjonale og lokale nivået. Selv om de fleste av disse prosjektene er relativt begrensete i omfang kan prosjektene likevel være kontroversielle på lokalt nivå. Dette er ikke minst tilfelle dersom slike prosjekter medfører endringer i vannreguleringen som igjen gir endringer i vassdraget eller det omkringliggende landskapet. O /U av eksisterende vannkraft blir ofte profilert som et klimapolitisk tiltak fordi dette kan bidra til at fossil energiproduksjon erstattes av klimavennlig vannkraft. I tillegg til dette kan O / U også innebære en mer stabil forsyningssikkerhet i Norge og Europa og dermed oppfylle energipolitiske mål ut over mål om reduserte klimagassutslipp. Ser man O/U i forhold til avveininger av miljømessige, økonomiske og sosiale hensyn, kan O / U ses som del av en forsterket prioritering av modifisering av eksisterende vannkraftproduksjon - gitt det begrensede potensialet for videre utvikling av storskala vannkraft i Norge. Politisk og strategisk er dette også understreket gjennom NVEs utkast til retningslinjer for vilkårsrevisjon (NVE 2010b). Så langt er det imidlertid få eksempler på hvordan dette kan gjennomføres i praksis. Dette berører også potensialet for vann-vinn-løsninger, der ulike vannkraftprosjekter vurderes i forhold til hverandre, ofte innenfor en regional kontekst (jf. Thaulow et al. 2008). Dette vil igjen kreve en mer strategisk tilnærming til vannkraft, både på nasjonalt og regionalt nivå.

Konsekvensutredninger (KU) står helt sentralt for å øke kunnskapsgrunnlaget for vannkraft. En utfordring er imidlertid at det standardiserte KU-rammeverket, på grunn av størrelse ved prosjektet, ikke kan anvendes i et økende antall prosjekter. Dette åpner opp for flere ulike tilnærminger. I tillegg legger interessenter og aktører ofte frem supplerende forskning og dokumentasjon for å fremme bestemte posisjoner og interesser. Dette avhenger imidlertid av de ulike partenes økonomiske ressurser. Med et mindre standardisert rammeverk for kunnskap og dokumentasjon fins det en klar risiko for at slike ressursforskjeller kan bidra til å påvirke konsesjonsutfallet i favør av de mest ressurssterke.

En annen viktig utfordring i konsesjonsprosessen knyttet til vannkraft, er mangelen på verktøy for å aggregere dokumentasjon og kunnskap - og herunder erfaringer. Dette blir spesielt relevant når alternative dokumentasjonsprosesser gir sprikende data og resultater. Dette gjelder særlig med hensyn til den aggregerte virkningen av småskala vannkraft, og virkningene av en mer omfattende bruk av pumpekraft i det norske vannkraftsystemet. For å håndtere disse nye utfordringene knyttet til kunnskapsgrunnlaget kan det være nyttig å etablere en kunnskapsdatabase med sikte på en form for standardisering av kunnskap fra vurderingen

av de ulike prosjektene (jf. Thaulow et al. 2007). En slik kunnskapsdatabase kan også bidra til en høyere grad av åpenhet og legitimitet til konsesjonsprosessen. Det er imidlertid viktig å påpeke at dette ikke nødvendigvis vil påvirke verken utfallene av konsesjonssakene eller løse de vanskelige avveiningene som må gjøres mellom miljømessige, økonomiske og sosiale hensyn. På samme tid kan muligheten av å trekke på kunnskap og erfaringer fra sammenlignbare saker, samt det å få tredjeparter til å gjennomgå kunnskap og dokumentasjon, synes å være viktige steg å ta for å opprettholde og styrke legitimiteten til konsesjonssystemet.

Rapporten er en første kartlegging av norsk vannkraftforvaltning som nå følges opp med mer case spesifikke analyser. Tilsvarende policy analyse er også gjennomført i Sverige (Rudberg 2011) og GOVREP har også initiert case studier i Sverige. Hensikten er å få et styrket grunnlag til å foreslå tiltak som bedre forener energi- og miljøpolitiske hensyn i fornybar elektrisitetsproduksjon.

## 2 Introduction

For decades, the development and construction of hydropower facilities have been the focus of significant political debates and controversies in Norway. Norwegian hydropower production and development is currently confronted with both new and well-established challenges. A decade ago it was stated politically that the era of further development of large-scale hydropower in Norway had ended (White Paper 37, 2000-01). Assuming that this position remains in force, an improved exploitation of existing hydropower plants, and the construction of small-scale plants, represents two of the most feasible options for further hydropower development. At the same time, the moratorium on further large-scale development is not written in stone, and further priorities related to hydropower are the object of ongoing political debates. The present report will highlight and discuss challenges related to both the phase-in of new hydropower, and the modification of existing production. The report focuses on the relevant policy objectives, regulatory framework, interests and concerns. The totality of these structures and measures being here treated as the overall ‘governance’ of Norwegian hydropower.

Several concerns and interests are activated when hydropower projects are planned and realised, as well as revised. The present report is part of the GOVREP project<sup>1</sup>. A major research question here is: ‘How to reconcile energy and environmental policy concerns in a better way?’ In order to identify the realistic potential for a better reconciliation within a Norwegian context, it is important to assess the degree of coordination between relevant policy domains and sectors – with related objectives, plans and regulations, as well as interests, actors and institutions. In other parts of the GOVREP project we study more explicitly how the formal framework is applied in particular cases, by focusing on specific hydropower projects (Egeland and Jacobsen 2011; Egeland forthcoming). In the present report we focus on the general features of the formal framework, including how and to what extent different interests and concerns are coordinated at the national level, focusing on the licensing processes for hydropower plants. By combining an overall, national approach – as reflected in the present report – with case-studies, the GOVREP project aims to highlight how the overall formal framework interacts with and affects the actual hydropower projects.

In order to assess both the status of policies and regulations, as well as further perspectives for the hydropower sector in Norway, we distinguish between the realisation of new hydropower production (both large- and small-scale) vs. the modification of established installations (refurbishment/upgrading and revision). The different project types are subject to somewhat different regulations and licensing procedures, as well as engagement from different stakeholders. This implies that different interests and concerns are activated differently depending on the project category. The terms ‘concerns’, ‘objectives’ and ‘interests’ are, therefore, important concepts for the present study. We will define and explain these concepts in Section 3 of the report.

The assessment and licensing of hydropower in Norway is substantially dependent on the application of knowledge and documentation. The status of knowledge in the governance of hydropower thus constitutes a

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<sup>1</sup> The research project *Governance for Renewable Electricity Production* (GOVREP; 2009-12) focuses on policies and regulations for renewable electricity in Norway and Sweden. The project is part of the Norwegian Centre for Environmental Design of Renewable Energy (CEDREN), and is co-funded by the Norwegian Research Council, Statkraft and Agder Energy Production.

specific focus of the report. Based on the insights generated by the report, we will also identify specific challenges for further knowledge-building and research.

In this context, the report focuses on two key questions:

*To what extent and how are different concerns, objectives and interests coordinated in relation to hydropower development in Norway?*

*To what extent and how is there a coordination across levels of governance?*

The methodology employed is primarily qualitative. The study is based on documentary analysis of public documents, governmental reports and other policy-related documentation. In addition, we have conducted a review of secondary literature – journal articles, edited books, scientific reports, and evaluations of policy-related and more technical issues – pertaining to hydropower. Finally we have conducted interviews, particularly with informants in the governmental agencies, to obtain background information.

The report proceeds, in Section 2, with an outline of the economic and political framework for hydropower. In Section 3 we provide an outline of the main concepts and the analytical framework employed in the report, including an outline of the relevant interests and concerns affected at both the strategic and project levels. Section 4 then identifies the main institutions and actors involved in the assessment of hydropower projects; and Section 5 presents the regulatory framework for Norwegian hydropower development, with a focus on the licensing process, which constitutes the principal governance arena for achieving balance between the different concerns, interests and objectives. Section 6 provides a discussion of the research questions raised above, with a particular focus on knowledge. Finally, in Section 7, we draw conclusions from the analysis, and outline key issues for further research and knowledge-building.

### 3 Hydropower in Norway: Resources and policy objectives

In 2009 net electricity consumption in Norway was 113 TWh. As one of the world’s leading producers of hydropower, Norway normally derives more than 90 per cent of its total national electricity consumption from hydro resources. In 2009, 96 percent of the electricity produced stemmed from hydropower (NVE 2011). The electricity consumption per capita is significantly higher than for other member countries of the International Energy Agency, mainly due to the high amount of electricity used for heating, as illustrated by Figure 1 (IEA 2011). Traditionally electricity has also been relatively cheap in Norway compared to other OECD and IEA countries.

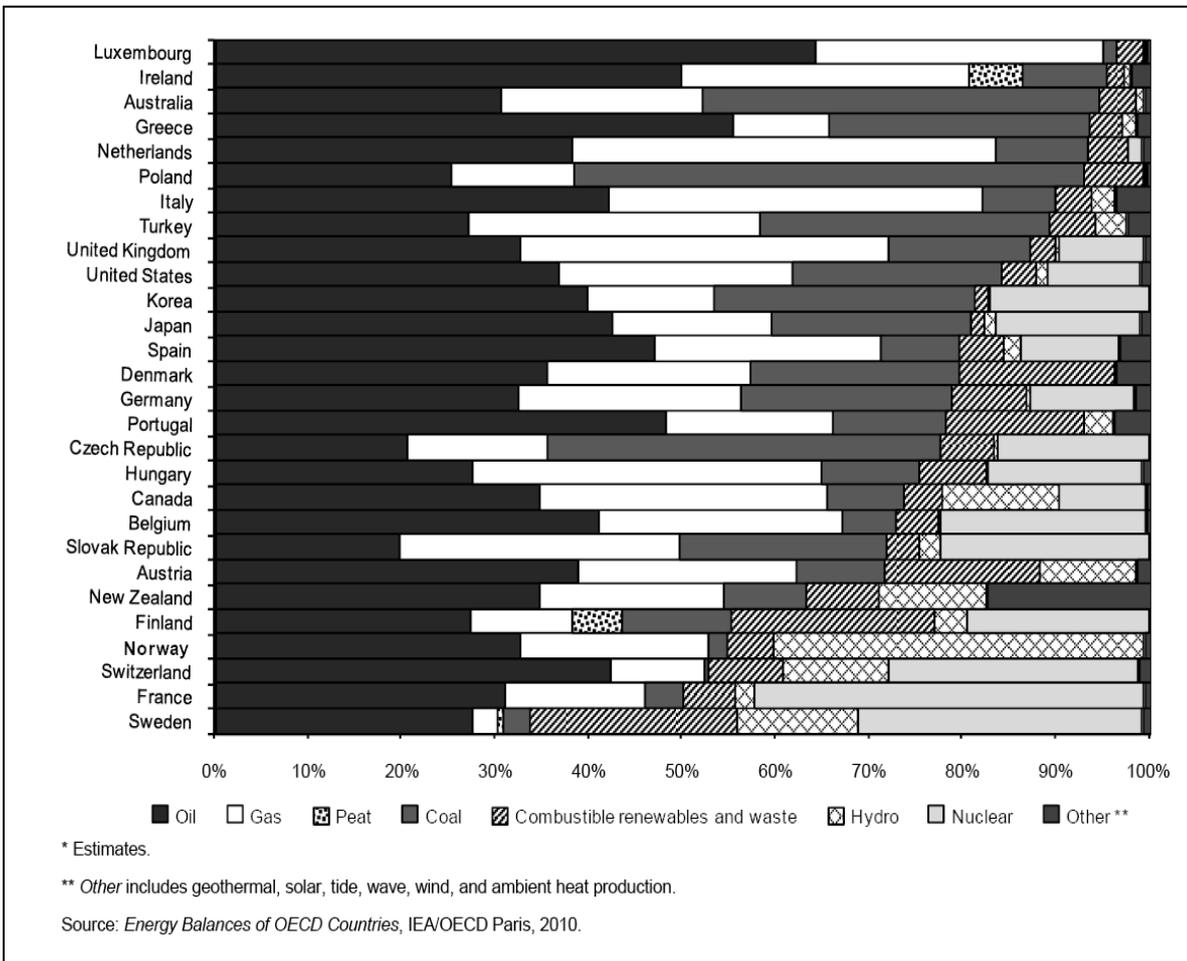


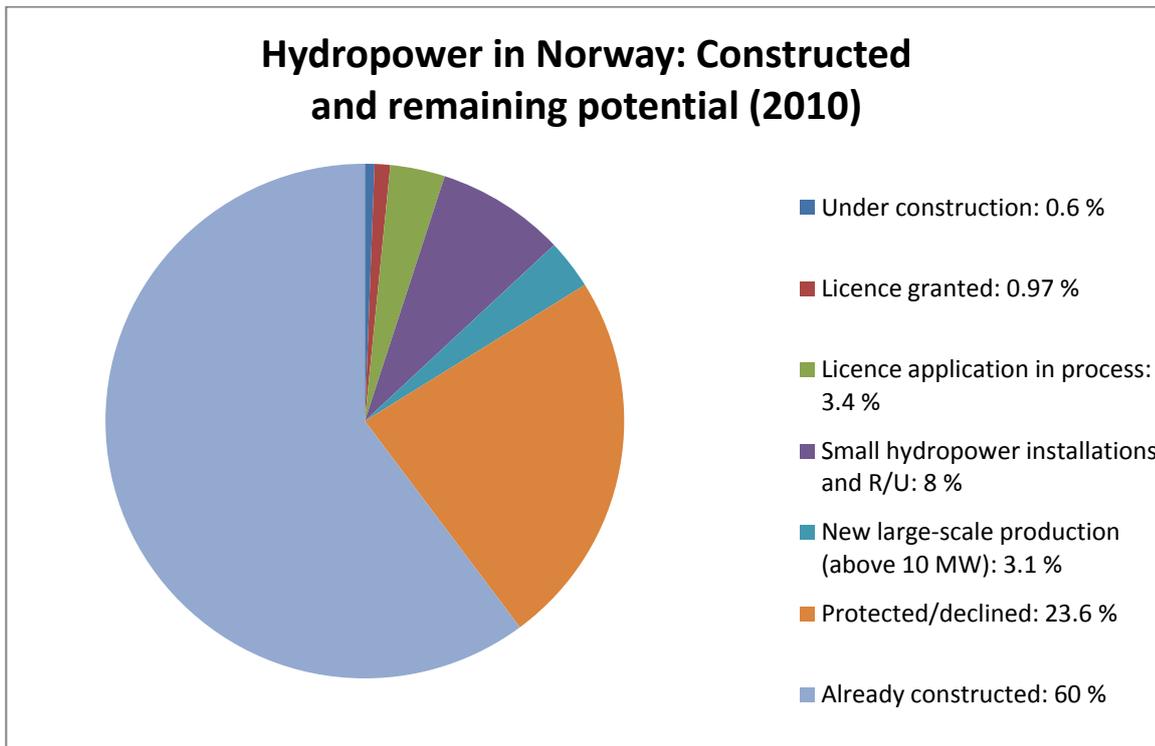
Figure 1: Sources of primary energy use in IEA member countries. (Source: IEA 2011).

A major guideline for the recent political approach has been the signal provided by the Prime Minister in 2001, where he stated that the ‘era of new large-scale hydropower constructions is over’. This approach was later approved by the Parliament (St.meld. 37, 2000-01). Given this overall political signal, it has been generally perceived that there is limited potential for further development of hydropower in Norway. There are, however, currently significant signals of an increasing interest in expanding the hydropower production

in Norway (Energi 2010). Norwegian energy companies have projected new hydropower production that can result in about 7.5 TWh increased hydropower production in Norway. In addition, a number of small scale hydropower plants are also projected with a stipulated total output of 5 TWh (ibid.). In addition, the political signal from 2001 is not written in stone and can be modified due to changing political circumstances. On the other hand, such projects are often controversial and the related licensing processes time-consuming. In addition to larger projects, two other options stand out as feasible alternatives for developing hydropower are mainly: (1) Construction of small-scale hydropower plants; and (2) Refurbishment and/or upgrading of existing power production.

Furthermore, and particularly related to a reinforced focus on environmental concerns, there is a third developmental ‘path’ represented by revisions of granted licenses. These revisions provide a basis for improving existing hydropower projects – but can at the same time imply possible reductions in the production volume. In addition to this, there is ongoing debate and consideration of the potential for using Norway’s hydropower system as an export of ‘balance’ to compensate for increased variable and less predictable renewable (wind and solar) electricity production in the EU. This can be done by extending the pumping and storage capacity in the Norwegian hydropower system, not least based on current and potentially increased reservoir capacity. This latter and more recent dimension of hydropower development is, however, not yet well documented.

As reflected in Figure 2 below, the total potential for hydropower production in Norway is estimated to be approximately 205 TWh, of which 123.4 TWh (60.2 percent) is already developed, and 48.6 TWh (23.7 percent) is protected or having been rejected through licensing assessments (NVE 2011). Hydropower plants currently under construction are estimated to produce 1.4 TWh (0.68 percent) in total, and licenses have been granted for projects not yet realised equivalent to a total output of 2 TWh (0.97 percent) (ibid.). Furthermore, 7 TWh (3.4 percent) are included in announced or submitted applications for licenses. The remaining hydropower potential is estimated to be approximately 16.5 TWh (8 percent) for small-scale hydropower, and 6.5 TWh (3.2 percent) for larger hydropower (above 10 MW installed capacity). The potential for refurbishment and upgrading is included within these 16.5 TWh (ibid.).



**Figure 2: Hydropower in Norway – Developed and potential resources 2010.** (NVE 2011a).

The Norwegian energy system cannot be understood without an analysis of the interaction between hydropower production and electricity consumption (Knudsen et al. 2008: 252). At the same time, there is no recent overall political strategy for the further development of hydropower, nor any coherent policy overview clarifying the role of hydropower. Hence, there is no politically adopted target for the amount of hydropower expected in the future. The last broad assessment of the Norwegian energy system, including the importance of hydropower, was provided by an expert commission in 1998 (MoPE 1998). Based on this report, the minority centrist government under Prime Minister Bondevik put forward in 1999 a White Paper discussing the future energy policy in Norway, not least the importance new, non-hydro renewables (St.meld. 29, 1998-99). The past decade has seen no update or revision of this White Paper, although the current ‘red-green’ coalition government has, on several occasions, signalled an intent to formulate a new White Paper. In March 2011, the Government appointed an expert commission to provide an updated analysis of Norwegian energy policy, which would constitute the basis for a new White Paper (MoPE 2011b). This commission is, however, committed in advance to respect the parliamentary decisions made with respect to the *Protection plans for watercourses* (ibid.) (see Section 5). In practice, these plans significantly reduce opportunities for construction of new, large-scale hydropower production.

Policy objectives with relevance for hydropower are intertwined with objectives and concerns from other policy areas, like economic and industrial policies, as well as environmental policies. For the latter aspect, as will be further elaborated in this report, there are even several – and partly inconsistent – policy concerns such as biodiversity versus climate change. Norway’s commitment for the reduction of greenhouse gas

(GHG) emissions, based on the Kyoto Protocol, is to limit emission growth to 1 pct. above the 1990 level. Rising climate awareness and political focus has led to an increased interest for new renewable energy production during the last decade. The Energy fund was established in 2001 as a way of economically stimulating wind power, renewable heating and energy efficiency. The Energy Fund has, however, not been attributed any role vis-à-vis hydropower.

The Parliament revised the national climate-change policies in 2008, and set more ambitious national emission reductions: 30 % by 2020, and 100 % ('carbon neutrality') by 2030 (Committee Recommendations 145, 2008). Two thirds of Norway's emission reductions are to be provided by national policy efforts, whereas one third will be fulfilled by employing the flexible mechanisms as allowed by the Kyoto Protocol. These decisions have thus far been unaffected by the uncertainty as to a future global climate policy regime and mechanisms for a post-Kyoto period (after 2012). At the same time, Norway has not yet decided to what extent policy measures from the different sectors, including energy, are to contribute to fulfilment of the targets for 2020 and 2030. The government will clarify this in a white paper on climate-change policy which is expected to be put forward during the autumn 2011. Based on a scoping report of relevant policy options commissioned by the Government and coordinated by the Climate and Pollution Agency, hydropower will not necessarily be a policy priority (Climate and Pollution Agency et al. 2010).

A major issue and concern is currently related to the eventual establishment of a common scheme for green certificates in order to finance new renewable electricity projects in Norway and Sweden, including hydropower. The scheme is expected to be in operation from 2012, and will build on the existing system in Sweden (originally established in 2003). The common scheme will be related to both countries' fulfilment of the national targets set through the EU Directive for renewable energy (RES) (OJEU 2009). The RES Directive builds on a former directive for the promotion of renewable electricity, by which Norway was committed (OJEC 2001; Knudsen et al. 2008). The EU RES Directive is still not formally adopted by Norway, although it is certain that Norway is committed to this regulation<sup>2</sup>. The final outcome of the negotiations between the EFTA and EU on the RES Directive, including a national target for Norway, is expected before autumn 2011 (Montel Power News 2011a). Little is publicly known as to the content of these negotiations, but due to Norway's renewable energy resources (both hydropower and wind power), it is expected that the EU side requires an ambitious national target for Norway (Ruud and Knudsen 2009). The critical challenge will then be to adopt the legislation on the Swedish-Norwegian certificate system – in both countries – sufficiently fast in order to get the system in operation by the beginning of 2012. Sweden has stated that a Norwegian target in accordance with the RES Directive is a prerequisite for a common system. Furthermore, a subsequent challenge in the follow-up of the system will be the management of two different systems for licensing – and the grid capacity related to increased shares of renewables.

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<sup>2</sup> As part of the EEA Agreement, Norway is committed to adopt and follow up EU legislation related to the internal market and regulation of economic activities, including energy. Secondly, the major part of environmentally oriented EU legislation is considered to have ramifications for the internal market, and is thus also binding for Norway. The legislation related to biodiversity is, however, (as mentioned above) not part of the EEA Agreement – and Norway has taken a more active part on the global scene within this issue area. Norway is not directly involved in the EU's climate policy, although the country takes part in the EU emission trading system (ETS) in order to regulate emissions of greenhouse gases (GHG).

In Norway in recent years, there has been an increased interest for small-scale hydropower development, as well as refurbishment and upgrading (R/U) of existing power plants. The R/U potential is also a function of the need for updating ageing hydropower installations. There has also been an increased focus on the potential of Norwegian for ‘balancing’ more periodic sources of alternative energy (primarily wind power) Europe. The latter perspective has also emerged as a result of heightened ambitions for renewable energy (RES), as stimulated by the EU RES Directive. In parallel, there is growing concern over the environmental status of Norwegian watercourses. The EU’s Water Framework Directive (WFD) has stimulated a debate on the future usage of water resources, with a considerable ‘unveiling’ of new conflicts of interest (see Section 5.2.6).

### 3.1 Towards a joint certificate scheme with Sweden

In December 2010 Norway and Sweden signed a protocol on the fundamental principles and the further follow-up of the common green certificate scheme (MoPE 2010). At the same time, a proposal for a Norwegian act on the system – reflecting the current Swedish legislation and the protocol, was forwarded to a public consultation. In April 2011, the Government put forward a proposal for a law based on the consultation (MoPE 2011a). The law is expected to be adopted by the Parliament in near future in order to ensure an implementation from January 2012.

According to what is stipulated at this stage, the system is to be technology-neutral and will hence encompass all scales of hydropower production (ibid.). A cornerstone of the system will be a common target of 26.4 TWh new RES-E production, which is to be distributed evenly between the two countries (13.2 TWh for each); that is, each country is to be attributed with the half of the realised production by 2020 – which will also be considered as a contribution to the fulfilment of the RES Directive (MoPE 2010). The system will provide equal support for every RES-E technology, although it is stipulated that Norway will accommodate larger shares of hydropower than Sweden, and Sweden larger shares of biomass-based generation – whereas wind power is expected to be relatively equally distributed between the countries (ibid.).

The Swedish-Norwegian cooperation must also be seen in light of the Nordic electricity market. Since the 1990’s, the wholesale trade between power producers, suppliers and major consumers of electricity in Norway is either taking place bilaterally, or through the Nordic Power Exchange, Nord Pool. Nord Pool is a direct consequence of Norway’s amended Energy Act of 1990. Established in 1993, it was the world’s first multinational exchange for the trade of electric power. It was originally a Norwegian-based market, but Sweden joined in 1996, Finland in 1998, and Denmark in 2000. Nord Pool involves the trading and clearance of physical and financial power contracts among the Nordic countries. The common Nordic electricity market has provided increased opportunities for import to Norway in periods of deficit and it has given Norwegian actors access to the wider European electricity market, by trading both physical and financial contracts.

### 3.2 Towards more comprehensive governance of hydropower production?

With the emergence of the Nordic power market and the gradual integration towards a European market, substantial and structural changes have occurred related to the management of the Norwegian hydropower system. These changes include the approaches to the water reservoirs, the use of pumping and storage as a way of responding to more volatile power prices in the market, as well as an increased need for coordination with the remaining power systems within the NordPool area, which are also substantially based on other resources than hydropower.

The eventual increase of pumping and storage will represent a challenge for the established hydropower licenses which were mainly based on inflows during the spring and summer to provide the necessary surplus for the hydropower production during the winter season. Because of this relatively more stable and predictable situation, there was a more limited need to issue restrictions on water level during the summer season. With a deregulated power market and the possibility to transmit hydropower abroad, the traditional structures have changed. The regulation of water currents, as stipulated by terms in the hydropower licenses, are now increasingly influenced by European energy prices, since project economy is an important part of the formulation of conditions related to the license. Thereby the producers are more inclined than before to tap from the water reservoirs at price peaks, regardless of the season.

On the background of stronger priorities of environmental concerns, the licensing authorities have in recent years set specific conditions stipulating a minimum water level for the summer season. These changes will broaden and deepen in near future, not least as the result of coming, additional transmission cables to Denmark, Germany and the Netherlands – as well as planned interconnectors with Great Britain. This is also closely related to the increased share of wind and solar power in neighbouring, European countries. The issue of storing renewable energy is a key challenge for the reinforced reliance on renewable electricity. Other ways of storing energy, as an alternative to hydropower, is also being discussed (c.f. CEDREN Newsletter, 2011).

An additional feature, which is important in order to understand the position of hydropower production in Norway, is the historical role of electricity in the country's industrialisation (Angell and Brekke, 2011). Traditionally the Norwegian State subsidized the energy-intensive industry with long-term contracts for low-cost supply of electricity. These contracts are now mainly expiring and many companies have concluded new, long-term contracts directly with the energy companies. The public subsidies are no longer viable as it is considered as state aid, and thereby not in accordance with the EEA Agreement (Knudsen et al. 2008: 253). In stead, the Norwegian government has launched a funding regime that permit Norwegian industrial companies to join in common pools of energy users that can opt for competitive electricity prices through long term contracts. It remains to be seen how possible amendments will affect the overall hydropower balance and eventually the industry's focus on both energy efficiency and alternative sources such as natural gas.

## 4 Governance for hydropower: Framework and concepts

'Governance' is a concept which has been much debated in political scientific literature during the last decade (Lafferty 2004; Pierre and Peters 2005; Jordan 2008). Without elaborating on the debate here, the literature provides a basis for defining 'governance' as the totality of mechanisms and instruments available for influencing social change according to political strategies and objectives (Lafferty 2004: 5). In this context, governance can be related to management strategies and decisions taken both by public authorities and non-public actors such as energy producers, NGOs, ad-hoc groups etc. Political, social and economic factors impact upon the society's steering of a certain policy field, or sector, and can therefore be related to the relevant 'governance' of, in this case, hydropower. The form of 'steering' in question is initiated by the government and subordinate agencies, in and through policy strategies, plans and legal acts. Overall objectives, interests and concerns are set by the government at the national level (increasingly related to supra-national agreements and commitments), but carried through in practice through numerous 'sub-regimes' and procedures that involve a multiplicity of actors, levels of responsibility, and individual local-regional projects.

So as to make the approach to governance more systematic, we distinguish between a 'horizontal' and a 'vertical' dimension of analysis. The horizontal dimension can be seen in relation to the different objectives and interests – across different policy domains and sectors – that will influence both strategically and in specific hydropower projects. The vertical dimension will be related to the interaction between the relevant levels of governance, from the international level via the national level to the regional and local levels.

The political and regulatory framework for Norwegian hydropower has emerged through different historical phases and has been marked by different political tendencies and ideological trends. The consideration and follow-up of different objectives and interests within the political and regulatory framework for hydropower in Norway has been altered and revised several times during the last decades. Established patterns and structures of governance related to a sector often continue to impact upon the current political and regulatory practice, and thereby constitute a 'path-dependence'. This can be related to how public authorities and different stakeholders interact and what kind of roles they are attributed. This is not least the case in energy-related issues, and substantially affects the potential of updating both framework conditions and the energy technology itself (c.f. Lafferty and Ruud 2008). In this report, we will particularly consider the path-dependence of: (1) established mandates and boundaries between sectors and sectoral agencies with relevance for hydropower, as well as (2) the procedures pertaining to licensing of hydropower. A critical test for the path-dependence of hydropower is the follow-up of international requirements and codification of this into national law, such as the EU Water Framework Directive.

## 4.1 Concerns, objectives and interests

‘Sustainable development’ is often associated with the ‘balancing’ of the ‘interests’ and ‘concerns’ of the so-called ‘three pillars’: the economic, social and environmental dimensions of societal development (c.f. Lafferty and Hovden 2003; Lafferty and Knudsen 2007: 7). Governance for sustainable development further implies conceptual and theoretical perspectives on strategies and mechanisms that can contribute to this goal (c.f. Knudsen 2009). Within this context, we find it important and fruitful to distinguish between the terms ‘interests’, ‘objectives’ and ‘concerns’ in the present report. Based on this approach, we here briefly introduce these terms according to economic, environmental and social domains – reflecting the ‘three pillars’ of sustainable development.

‘Interests’ are here seen to be generated according to specific actors promoting certain objectives or concerns. In this perspective, therefore, environmental concerns and policy objectives can also constitute ‘interests’. Concerns, however, are less bound to certain actors’ promotion, but can be part of, for example, the legislation which aims at protecting the nature in general, not being part of a specific interest. At the same time, when certain species are specifically protected according to a policy objective, one can contend that this protection scheme also represents an ‘environmental interest’. Hence, the main point is that we refer to ‘interests’ in stead of ‘concerns’, once the ‘concerns’ are promoted actively by one or more actors in order to achieve a (more or less clearly) set ‘objective’ or ‘target’.<sup>3</sup>

### 4.1.1 Economic concerns, objectives and interests

There are several economic interests related to a watercourse, many of which are competing – and often in conflict. On the one hand, there are the interests of the hydropower developer who wants to maximise the profitability of the production. On the other hand, the municipality ‘hosting’ the hydropower plant also has economic interests related to the plant and its production. Some hydropower projects affect, moreover, several municipalities by inter-connected regulations in the watercourse. In addition, several Norwegian municipalities have shares and direct ownership in hydropower companies. Many of the regionally based energy companies that have emerged since the 1990’s are also owned by several municipalities together. Thereby, the municipalities often also have an economic interest in ensuring the realisation of the project, including eventual expansions of existing production.

The municipalities will also obtain incomes through the tax system, as will be elaborated in Section 4.1. In addition, the municipalities can obtain incomes through rights formalised by the licensing system; such as license fees and hydropower at moderate prices. The hydropower companies must also frequently provide resources for local industrial funds and other compensatory arrangements. In addition to these direct incomes, hydropower projects can also generate indirect benefits and economic incomes like, for example, new employment, improved infrastructure, and new or enhanced roads. However, the municipality itself and

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<sup>3</sup> The task of integrating environmental values and concerns into social and economic policy for the sake of promoting sustainable development, is legally prescribed by the ‘Consolidated Treaty on the Functioning of the European Union’ (Articles 11 and 37). See OJEU (2010).

its inhabitants can also have economic and social interests related to the watercourse, which are independent of the hydropower plant and production. In rural regions in Norway this is particularly related to tourism, outdoor recreation and fishing.

A major challenge is usually how to calculate the exact incomes related to many of these activities. This will often depend on the degree to which one also includes more indirect costs and benefits – like the attractiveness of an area or the municipality, and the community's efforts of profiling itself in relation to, for example, tourism. The expectations related to current and future incomes from such activities are, moreover, often important premises for the local opinion about the hydropower project in question – which, in turn, will substantially influence the municipality's stance towards the project.

In addition to the more apparent economic interests related to hydropower, there are also less specific economic concerns which can be associated with the general objective of further economic growth. The more indirect economic effects and repercussions that are assumed to occur as a consequence of hydropower development, both large- and small-scale (rural development and additional activity for agriculture), can be seen as economic concerns that are taken into consideration in the assessment of the feasibility of hydropower projects.

#### **4.1.2 Environmental concerns, objectives and interests**

There are several environmental interests and concerns related to a watercourse. The most prevalent environmental concerns are often identified by relevant policy targets and regulatory requirements. In this way, environmental concerns also can become interests promoted by certain actors. In general, environmental concerns are represented by environmental authorities and the environmental interest organisations, whereas other stakeholders can have economic interests which are (more or less) compatible with environmental concerns.

On the one hand, environmental concerns are related to the safeguarding of water ecology and the preservation of the biological diversity, both in the specific watercourse as well as in the surrounding environment, which can be affected by installations and structures pertaining to the hydropower production. On the other hand, the watercourses represent potential hydropower resources which can increase Norway's production of non-fossil energy, thereby contributing to reduce the emissions of greenhouse gases. These two main categories of environmental concerns (nature protection and biodiversity, and climate change) are potentially conflicting, and risk increasingly to be so – given the different implications for the watercourses. Adding to this complexity there are different, not coordinated, national policy objectives for biodiversity and climate-change respectively, anchored within international commitments. Thus far, there has not been conducted any trade-off between these different environmental concerns and no assessment as to how they should be combined in relation to hydropower (Ruud et al. 2010).

Hence, different environmental concerns may also be promoted and emphasised differently by different parts of the public authorities. These two main categories of environmental concerns/interests – biodiversity and climate change, can often be activated at the same time within specific projects, albeit being promoted by different actors and stakeholders. As indicated above, some actors may also employ arguments pertaining to environmental concerns in order to promote economic interests at the same time.

### 4.1.3 Social concerns, objectives and interests

Social concerns and interests can be associated with different issues, depending on what perspective is employed. On the one hand, at the national level, one can speak of the provision of electricity as a prerequisite for welfare, and, hence as a social concern in itself; and, thereby also, ‘a public interest’. Historically, hydropower in Norway has also been associated with a ‘nation-building process’, representing the key infrastructure for economic growth and welfare, through electrification (Angell and Brekke 2011). At the local level, hydropower may also imply welfare for the municipality hosting the hydropower plant (as will be described in Section 4), but at the same time other stakeholders may perceive hydropower installations as a barrier to outdoor recreation – not least fishing. Tourism is, moreover, an increasingly important industry in rural areas in Norway, and many protagonists from this industry are critical towards the impact of hydropower installations on the landscape.

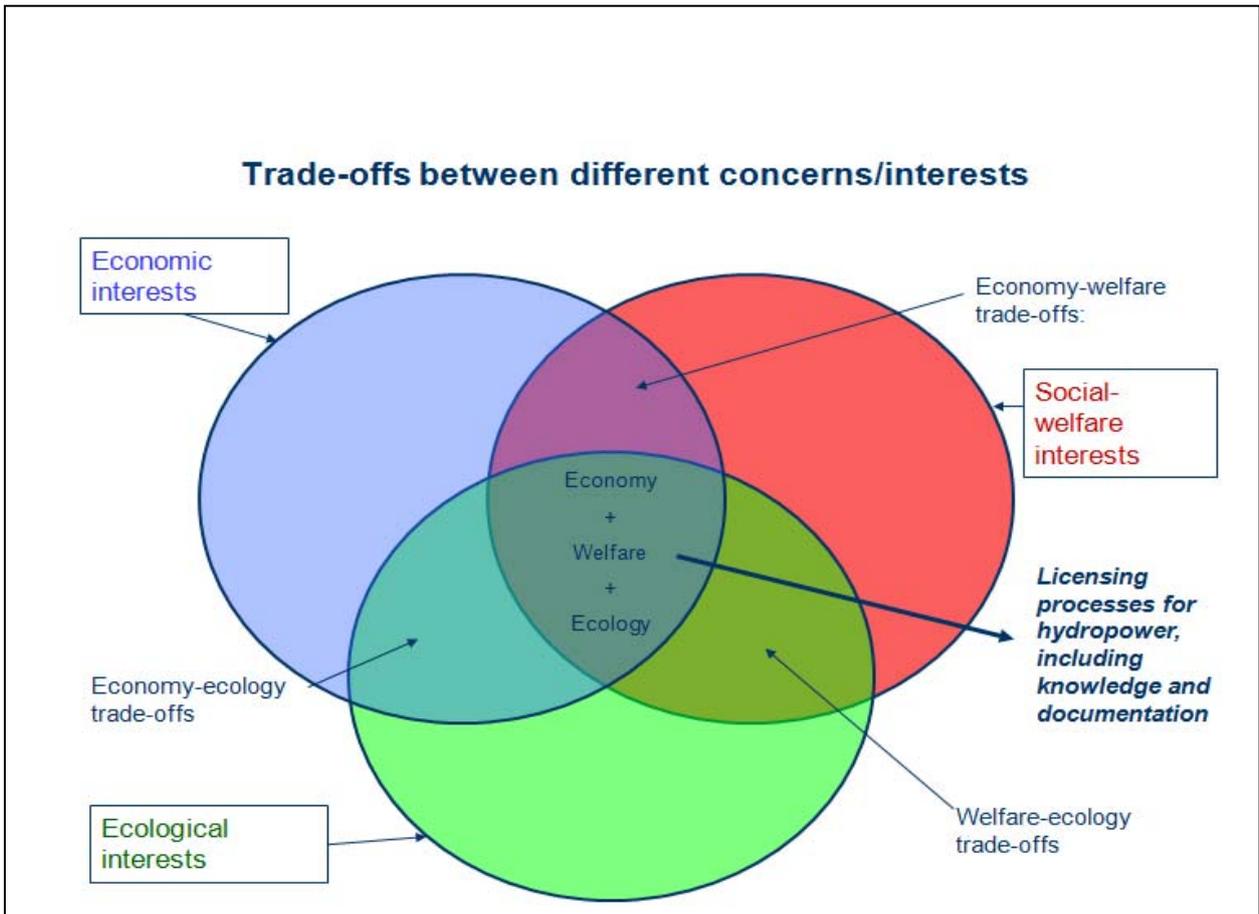
Furthermore, within a national perspective, hydropower projects are important elements in ensuring economic activity, employment and welfare in all regions in Norway. Rural and regional developments represent very strong interests, both historically and currently, within a Norwegian political context, and the secure provision of electricity to the very scattered Norwegian population is a major national concern. Hence, hydropower as a means of inducing a higher level of security of supply is a very crucial social concern and interest.

On the local level, the character and role of social concerns and interest are generally dependent on the specific hydropower project, and the actual impacts within the particular context. However, as indicated, tourism and recreational fishing are typically concerns that become interests in opposition to hydropower development. Such interests are also often substantially intertwined with economic interests. There are, nevertheless, also social interests lacking clear economic impacts; for example more aesthetic and historical considerations related to the landscape within which the hydropower installation is to be located. A typical issue provoking divergences involving social concerns is related to water regulation and the water level. In such cases, it is not always evident that a regulated water level, differentiated according to the hydropower plant’s production scheme, actually is damaging for the natural environment and particular species. Such variations in water level can, nonetheless, be perceived as disturbing by neighbours and local inhabitants who are used to a specific landscape around the watercourse.

## 4.2 Coordination of different concerns, and trade-off processes

The degree to which and how different concerns and interests are coordinated at the same level, as well as across levels of governance, constitutes an important part of our analysis. Coordination can occur, on the one hand, in the form of formal plans and regulations, and the related practice by public authorities. In addition, different interests and concerns will both be promoted by and affect various stakeholders differently. On the one hand, this is a coordination related to the different sectors and policy domains, as well as between levels of governance. On the other hand, there is a more specific trade-off between affected interests and concerns related to the individual hydropower projects. This trade-off, which is an important part of the licensing process – as will be elaborated in Section 5 – can be illustrated by Figure 3 below. The figure includes the interests and concerns discussed above; that is, related to the economic, environmental and social ‘pillars’ of sustainable development. In general, various interests are promoted vis-à-vis the licensing process, whereas the licensing authorities conduct the final trade-off between these, also as reflected by policy objectives and concerns accommodated by the legal framework.

Thus, the most significant trade-off for hydropower can be associated with the *licensing processes*. The licensing and revision of granted licenses for hydropower production constitutes an arena where different sectors and stakeholders – public and non-public – present their views on the project, based on different sets of interests. Within the licensing process a trade-off between these interests, as well as other concerns and policy objectives, is conducted by the licensing authorities.



**Figure 3:** Interests and trade-offs among economic, environmental and social policy domains.

In Norway it is the Norwegian Directorate for Energy and Water resources (NVE), together with the Ministry of Petroleum and Energy (MoPE) which constitute this authority. As will be further elaborated in Sections 4 and 5, this authority is substantially dependent on inputs from other regulatory authorities as well – not least on the environmental side. Hence, licensing processes are influenced by a number of factors related to political objectives and guidelines, economic structures and specific requirements stemming from the legislation. The eventual granting of a licence, or a revised version of an older licence, can both be considered as ‘*outputs*’ from the licensing processes. In addition, one can also speak of the actual ‘*outcomes*’ of hydropower, related to what can be termed the ‘state of sustainability’; that is, the environmental, economic and social consequences and results stemming from of the hydropower projects. This can be associated with, for example, less greenhouse gas emissions; changes in the level of nature protection and changes in the level of electricity generation. In other parts of the GOVREP project actual environmental outcomes are investigated more concretely, in relation to a comparison between small- and large-scale hydropower (Bakken et al. 2011, forthcoming).

As indicated by Figure 3, and as will be more concretely illustrated by the case studies conducted within the GOVREP project (see Egeland and Jacobsen 2011, forthcoming; Egeland, forthcoming), the importance of

*knowledge* in licensing processes for hydropower is vital: Both what is produced, by whom – and, not least; *how* the knowledge production is perceived by stakeholders, as well as how it is and channelled into and impacting the licensing process. Generally, such knowledge is both employed by specific actors, and are thereby related to specific political and economic interests – as well as being part of more formalised requirements following from the procedures pertaining to the licensing processes. Furthermore, the relative importance of knowledge and documentation also depends on the interests and concerns involved in the licensing processes. There are clear examples from projects with a high conflict level where there have been strong public debates not substantially informed by the knowledge produced as part of the licensing process, and where the outputs are clearly influenced by the relative positions of the interests involved, as well as the course of the debate and the media coverage involved – with little emphasis on knowledge and documentation (Thaulow 2010).



## 5 Principal institutions and actors related to hydro power production – and related interests and concerns

In this section, we will provide an outline of the principal governing agencies and institutions with relevant mandates for the licensing of hydropower in Norway, as well as the major stakeholders whose interests are affected by this framework.

### 5.1 Principal regulatory agencies

In this sub-section we will give an overview and assessment of the main regulatory agencies with the mandate of formulating, implementing and applying the formal framework pertaining to the realisation of new hydropower, and modifications of existing projects in Norway.

#### 5.1.1 The responsible ministries

The principal institutional actor in the energy sector is the *Ministry of Petroleum and Energy* (MoPE). The MoPE has the overall responsibility for the energy policy of Norway, and thereby also the policies affecting hydropower. In addition to being the political secretariat for the Minister of Energy and Petroleum, the MoPE is responsible for formulating the regulations which supplement the different legal acts that are to guide the development of hydropower. The MoPE is also the appeals instance for licenses granted by the NVE.

The crucial inter-ministerial axis for hydropower goes between the MoPE and the *Ministry of the Environment* (MoE). MoE is particularly involved in all issues pertaining to nature and landscape protection, biodiversity, as well as land-use and spatial planning. In addition, the MoE is responsible for the climate-change policy in Norway. The climate-policy dimension has thus far been less prevalent in the MoE's dealings with hydropower issues. MoE and its subordinate agencies are also responsible for coordinating and approving environmental assessments concerning larger hydropower plants.

#### 5.1.2 The Norwegian Water Resources and Energy Directorate (NVE)

As a sub-ordinate agency to the MoPE, the Norwegian Water Resources and Energy Directorate (NVE), has the following responsibilities: Managing Norway's water resources; promoting an efficient energy market and cost-effective energy system; and promoting efficient energy use. The NVE is by origin anchored within the hydropower segment in Norway, and was established in 1921 based on the public river basin management established in the late 19<sup>th</sup> century. From 1991, in the aftermath of the adoption of the Energy Act, NVE became a directorate with a broader energy policy mandate, as reflected in the changed name. Hydropower management is still a very prominent part of the mandate. The Directorate is mandated by the Energy Act to issue licenses for new electricity production, including both hydropower and other energy forms (wind power, bioenergy, national use of natural gas).

In brief, the NVE is responsible for handling the applications for hydropower licenses – and the related assessments and trade-offs of different concerns and interests. NVE conducts the initial assessment, consider the need for impact assessments, and coordinate different inputs and view points received through the public consultations. For large hydropower projects the NVE forwards a recommendation to the MoPE which then prepares the case for the Government which is to draw the final conclusion, by the King in Council; that is, the Government's weekly meeting with the King. In Norway, the King must sign all the Government's decisions before they can be executed and implemented. For the largest and potentially most controversial hydropower projects, the Parliament has to approve the Government's recommended conclusion. For small hydropower installations (below 10 MW installed capacity), the NVE grants the applications directly, without involving the MoPE formally. In such cases, the MoPE can, however, intervene in a second round if any parties affected files a petition on the NVE's decision.

The NVE conducts its assessment of the different hydropower projects based on the legal acts involved, as well as both general and specific knowledge and documentation provided in relation to the specific project in question. Inputs on documentation and assessment will be provided by the hearing processes organised in relation to the announcement and the application for license. In addition, the NVE convenes and participates in inspections on the project site. As part of the NVE's assessment, the trade-off between the general, societal concerns and interests – both related to the national and local levels – and the more specific interests affected by the project itself – is an important task. This involves economic, environmental and other societal issues. Hence, the *knowledge basis* for the assessments conducted by the NVE becomes a very important part of the process. Thus, by its coordination of different inputs and requirements for documentation, the NVE plays an important role vis-à-vis the knowledge basis for hydropower in Norway. The decision-making processes related to hydropower projects, including the granting of new licenses, or revisions of already granted ones, provides several junctures at which it is both possible and feasible for the parties involved to provide inputs on documentation and assessments of the project and related consequences (see Section 5).

It has during recent years been raised questions as to the NVE's capacity in managing an increasing number of license applications, as well as an increasing number of cross-cutting issues. Until 2008, the NVE repeatedly reported that it was understaffed and not able to handle all the incoming license applications, particularly related to wind power (Knudsen et al. 2008: 259). On the background of the capacity challenges, the NVE in 2008 adopted internal guidelines (formulated in dialogue with the MoPE) concerning the priority of different cases. This challenge has been relieved in recent years, by successive reinforcements of the agency's staff working on licensing (Montel power news 2011b). However, the time frame for an actual output of the licensing process is still considerable, and given the large number of revision of (terms of) licenses expected to appear the coming 10-15 years, capacity challenges may still be the case for the NVE.

### 5.1.3 The Norwegian Directorate for Nature Management (DN)

DN serves as an executive and advisory body for the MoE, and the main areas of responsibility are nature protection and management, the conservation and sustainable use of biodiversity, as well as outdoor recreation. The directorate was established in 1985, based on a merger between the then Directorate for the

management of wildlife and in-land fish and some parts of the MoE. The DN is the main agent for the environmental administration in hydropower issues, and plays an important role in licensing processes for hydropower. Environmental objectives and concerns generally do not have a committing nature vis-à-vis hydropower, and mainly serve as inputs to the assessments conducted by the NVE. Hence, the legislation managed by the DN does not provide it with a mandate of instructing the NVE in relation to licensing of hydropower.

However, DN assesses impacts on the natural environment of planned energy installations. DN also advises the energy authorities in relation to the development of energy infrastructure and installations, and improved adaptation of such installations vis-à-vis the natural environment. There are also continuous dialogues with the NVE in general policy matters pertaining to hydropower; not least related to the development of small-scale hydropower; and the trade-off between large-scale and small-scale hydropower construction. With direct relevance for hydropower development, DN has the responsibility for water management in Norway and is coordinating the follow-up of the Water regulation – which is the main implementation instrument of the EU Water Framework Directive. In addition, the DN has also the responsibility for the management, including mapping and documentation of living conditions of inland fish and wild salmon (the Atlantic salmon). Furthermore, the DN has an overall responsibility for the management and improvement of the biological diversity in Norway. Related to this the directorate supervises the country's biodiversity, not least as a way of fulfilling Norway's international commitments in this regard.

DN is interacting with the work of County Governors' offices in several matters pertaining to hydropower. This is also related to wildlife management and outdoor recreation. In this way, transfers of knowledge – both ways and also related to experiences with specific cases, is an important element. In addition, the DN is mandated to monitor national policy objectives, priorities and guidelines, and whether they are followed up at the regional level. Thus, an objective for the DN is to stimulate a more standardized practice across the different counties and County Governors' offices.

#### **5.1.4 The Climate and Pollution Agency (KLIF)**

The Norwegian Climate and Pollution Agency (Klima- og forurensningsdirektoratet; KLIF) has a more indirect mandate vis-à-vis hydropower. KLIF has the responsibility for the regulation of pollutants related to energy production, or other factors affecting the chemical composition of watercourses. KLIF can be provided a more important role in coming years, however, if the forthcoming white paper on climate-change policy provides a stronger priority for new renewable energy production, and hence a stronger linkage between climate and energy policies.

#### **5.1.5 Directorate for Cultural Heritage (RA)**

In addition, to the NVE, DN and KLIF, the Directorate for Cultural Heritage (Riksantikvaren; RA) can also be a relevant authority at the national level. The Directorate is always a hearing instance, and can also

recommend specific measures in order to preserve, not only buildings, but also parts of a cultural landscape. The RA, therefore, often provides hearing comments for hydropower projects. As a result of an increased policy interest and reinforced objectives for cultural heritage, the formal basis for suggestion protection measures in relation to hydropower projects has been reinforced in recent years. Hence, the protection of buildings and installations related to hydropower production constitutes a reinforced interest. The reinforced priority of cultural heritage interests also implies increased requirements related to documentation and impact assessment for hydropower developers.

### 5.1.6 The regional level

*The Offices of the County Governor* – and more particularly, their departments for the environment and nature management, contribute to the assessment of environmental consequences of hydropower, by providing comments during the hearing processes, and also providing inputs to the NVE as part of the licensing process. The County Governor also assesses and recommends specific measures to compensate the impacts caused by energy installations. These measures are often based on *standard conditions* (formulated as part of the Watercourse Regulation Act; see Section 5). More limited measures, as for example related to fish stock in a limited part of a watercourse, can be decided by the County Governor without any further approval from the NVE.

In relation to some cases, affecting specific interests and concerns, the County Governor also acts on the basis of more explicit guidelines from the DN. This is the case in hydropower projects, both large- and small-scale, affecting national salmon watercourses. In such cases, the DN is the principal sender of hearing comments. The County Governors do also provide inputs and documentation as to various environmental impacts, as well as local experiences with various hydropower projects. In this way, the work of the County Governors is an important part of the environmental administration's knowledge basis. In specific cases, moreover, hearing comments from the County Governors are the main basis for the DN's hearing comment and position vis-à-vis the licensing authorities (NVE/MoPE). All hydropower cases commented or which implies an involvement from County Governors, must also be communicated to the DN. The County Governor also provides assessments and recommendations as to the eventual granting of licenses according to the Water Resources Act (see below).

The County Governor has been responsible for the phase-in of the EU WFD in Norway and led the processes of defining the Regional Water Basin Management Plans during the first phase of implementation. From 2010 this responsibility was transferred to the County Councils which now have responsibility for follow-up at the regional level; that is, the planning processes and the management of the regional committees and working groups. The County Governor remains, however, in charge as an advisor and knowledge provider for watercourse management and the WFD.

The County Governor as a whole has a rather complex mandate and is, in principle, to balance different national policy objectives, interests and concerns when making its assessments and formulating positions on hydropower projects. The mandate related to nature protection and biodiversity is, however, much more

clearly defined than any eventual follow-up of a wider energy policy objective, or climate-change. In the latter case the County Governor's major role is to approve the municipal planning documents, and ensure the introduction of more sustainable transport and land use at the local level. The County Governors are also responsible for overseeing the national agricultural policy. In relation to this latter case, diverging views with the environmental department can emerge, not least because of the frequent connection made between small-scale hydropower development and the potential value creation for agricultural interests.

In addition to playing an increasingly important part for the overall management of the watercourses, the **County Council's administrations** have from 2010 taken over the responsibility for general outdoor recreation and the management of wildlife and inland fish stocks. In addition, most County Councils have assumed an overall regional responsibility for climate-change mitigation. The main instrument in this regard is the planning and land use policy, by which the County Councils can stipulate and guide how land areas can be exploited within the county – not least through the Council's overall responsibility for transport. Based on its role in land use planning, the County Councils have been encouraged by the current Government to formulate county-based plans for the development of small-scale hydropower (MoPE 2007). Thus far, only four counties have formulated plans, but none have been finally approved by the MoE (the planning authority at the national level).

### 5.1.7 The municipalities

The local level is crucial for the actual realisation of hydropower projects. Particularly given the possible resistance from neighbours and other local stakeholders, the energy companies' strategies and approaches towards the local level has been increasingly emphasised in recent years. Not least through the Planning and Building Act (PBA), the municipalities assume an important responsibility in the processes related to impact assessments, as well as providing knowledge on local conditions that are useful both for the energy companies and the national regulatory agencies. The role of the municipalities through the use of the PBA has, however, been somewhat changed – due to a recent amendment of the act (see Section 5).

The municipalities also manage the multitude of economic and social concerns and interests related to a watercourse, many of which are often in conflict. The municipalities hosting hydropower plants generally have economic interests related to the plant and its production. Some hydropower projects affect, moreover, several municipalities by related regulations in the watercourse, and thereby imply that several municipalities have economic interests related to the project. In addition, many Norwegian municipalities have shares and direct ownership in hydropower companies. Several of the regionally based energy companies that have emerged since the 1990's are also owned by several municipalities together. Consequently, municipalities often have an economic interest in ensuring the realisation of the hydropower projects, including eventual expansions of existing production.

However, the municipality itself and its inhabitants can also have economic and social interests related to the watercourse, which are independent of the hydropower plants. In rural regions in Norway this is particularly related to tourism, outdoor recreation and salmon fishing. The expectations related to current and future

incomes from such activities are often important premises for the local opinion about the hydropower project in question – which, in turn, will substantially influence the municipality’s stance towards the project.

In order to have a direct pay-off from the hydropower activities, the hydropower operators pay taxes and fees to the municipality where the plant is located. The following revenues schemes are available:

- A profitability-independent **natural resources tax** paid to the municipal authority and the county authority is levied on hydropower producers. Approximately one fifth is allocated to the county authority, the remaining part to the municipal authority (MoPE 2008a: 34). The calculation base for the tax on natural resource extraction is determined for each power station, and is the average of the plant’s total output of electricity in the income year and the six preceding years. The natural resource tax does not represent an additional financial burden to the companies, as it can be deducted from income tax and, in the event of a difference, can be carried forward with interest (ibid.). Smaller hydropower plants are not part of this tax arrangement. Small-scale hydropower are also exempted from other taxes in order to economically stimulate the development.
- **License fees** represent compensation for damage caused to districts in which water resources are exploited. They are also an instrument for allowing rural areas to have a share in the financial return on hydropower development. Within specified maximum and minimum limits, fees are determined by assessment undertaken by the NVE (MoPE 2008a:35). If the watercourse and hydropower plant in question are affecting more than one municipality, the NVE’s assessment also includes the question of how to distribute the incomes provided by the fees between concerned municipalities;. This evaluation attaches importance to such factors as the degree of environmental disturbance and the profitability of the development (ibid). NVE adjusts the license fee every five years. License fees provided NOK 520 million to the municipal authorities and NOK 126 million the central government in 2007 (ibid.). The license fees are set as term in the licenses mandated by the Watercourse Regulation Act (see Section 5).
- Municipal authorities affected by hydropower developments are also entitled to buy a proportion of the power generated; ‘**license power**’. The licensee can be required to sell up to 10 per cent of the electricity generated to the municipalities concerned (MoPE 2008a:35). If this exceeds general power consumption in the municipalities, the county authority is entitled to buy the surplus. The licensee can also be required to sell up to five per cent of the power generated to the central government, but the latter has not exercised this right so far. In parallel with licence fees, the question of license power is assessed by the NVE as part of the licensing process, and is regulated by the Industrial Licensing Act and the Watercourse Regulation Act. The price paid by the power recipient must correspond roughly to generating costs or the full cost of delivery. There are currently two price setting regulations (ibid.). For licences issued before 1959, the price is negotiated between the licensee and the municipal authority, limited to a maximum price. For licences issued after 1959, the price is set by the Ministry of Petroleum and Energy in accordance with full costs for a

representative selection of power stations. The financial significance of the obligatory sale of power is equivalent to the difference between the price for the power in the market and the price for obligatory power including the input tax. Deliveries under these provisions total about 8.5 TWh per year (ibid.). Such conditioned power supplies are set as terms in the licenses mandated by the Watercourse Regulation Act.

- The municipal authorities can also levy a **property tax** on the production plant. This tax must be calculated in a way that reflects the market value of the property (MoPE 2008a: 34).
- **Municipal funds:** The licensee can be required to provide economic resources to a fund in order to compensate municipalities affected by the licensed hydropower plant and production. The level of this funding is set as part of the licensing process, and is reimbursed as a lump sum once the license is granted. The main objective of such funds is to support local industrial development, particularly in cases where industrial development has been hampered by the hydropower development. As for license fees and license power, this arrangement is related to the licenses mandated by the Watercourse Regulation Act (see Section 5). Municipal funds can also be specifically dedicated to environmental objectives, and be termed ‘environmental funds’.
- **Other compensatory arrangements:** The provision of support for local investments in, for example, infrastructure like local roads, bridges or other constructions, are increasingly employed by the hydropower developers in order to alleviate the inconveniences perceived by local authorities, neighbours, and other affected local interests. Such arrangements are often agreed upon as part of the negotiation with the municipality in order to obtain the necessary building permissions, and are not part of the licensing requirements set by the national regulator, NVE. These arrangements, outside the licensing process, also include eventual agreements with private interests and land owners.

## 5.2 Principal stakeholders

Interest groups affected by hydropower development encompass both municipalities, as outlined above, the electricity producers themselves, and the industries depending on hydropower-based electricity. In addition, the NGO’s, including the environmental movement, are often highly engaged in hydropower development issues. The present section provides an overview of the main categories of stakeholders, and their national interest organisations. In addition to the national confederations and interest organisations, there are also important groups which are mainly active at the local level – like ad hoc organisations established in relation to specific hydropower projects. Local groups can both represent opposition and resistance towards hydropower development, as well as stakeholders having an interest in, for example, the building of small-scale hydropower plants. Furthermore, there are NGO’s where the regional or county level is an important one. For example there are often small local groups representing some of the national environmental NGO’s (Friends of the Earth Norway, WWF Norway etc.), which lack resources and capacities in following up on specific hydropower projects, and therefore eventually draw upon the capabilities of their county-level organisation.

## 5.2.1 The electricity producers

The Norwegian hydropower sector is characterized by a relatively large number of companies. Moreover, the majority of the companies have a majority of public shareholders; both the State, the counties and the municipalities. This is in contrast to Sweden and Finland, where the number of hydropower companies traditionally has been more limited. Furthermore, the deregulation has accelerated a tendency of merger – and led to a larger degree of market consolidation (c.f. Chen and Johnson 2008; Kivimaa 2008). The interests of the hydropower producing companies in Norway are promoted by the branch organization Energy Norway, which also assembles companies producing electricity and heating from other sources as well, in addition to those supplying electricity - the utility companies.

The electricity companies also have an important, complementary role vis-à-vis the public authorities by undertaking initial trade-offs between the different interests and concerns affected by the hydropower project in question. Already in the phase of project announcement, as well as in the license application, it is important to identify and formulate an appropriate frame and profile for the project, as well as establishing a dialogue with the municipality and other local stakeholders.

*Statkraft* is the largest hydropower producer in Norway, with approximately 30 per cent of total production capacity. In 1992, as a direct consequence of the Energy Act of 1991, the state-owned enterprise ‘National Power Company’ (Statkraftverkene) was divided into two separate state-owned units: Statnett SF and Statkraft SF. The first runs the monopoly-based transmission of power and has national system-wide responsibility for the electricity grid, while the second is responsible for the generation of electricity. As for Statkraft, its ownership was transferred from the MoPE to the Ministry of Trade and Industry in 2002. In October 2004 Statkraft changed its status from a state-owned enterprise to a limited stock company. With a total power production of 42 TWh, the Statkraft group is the third-largest producer of electricity in the Nordic region, as well as the second-largest producer of renewable energy in Europe. In Norway it also operates through an increasing number of subsidiaries and attached companies, all of which are regionally important enterprises such as Agder Energy, Skagerrak Energy and BKK. These companies together constitute the ‘Statkraft alliance’.

The second largest hydropower producer in Norway is E-CO Energy, based on Oslo’s former municipal electricity company. E-CO currently has an average annual production at 9.7 TWh.

A restructuring of companies and ownership took place, particularly during the period 1999-2001 (MoPE 2008a). Many public owners, such as municipalities and counties have sold their shares in the power companies. At the same time, larger regional energy companies – with large interests in hydropower – have been established. Examples of these companies are Lyse (based in Stavanger, South-west of Norway), Agder Energy (based in Kristiansand in southern Norway), BKK (based in Bergen, on the western coast), TrønderEnergi (based in Trondheim, central Norway), Skagerak Energy (based in Porsgrunn, Southern

Norway), and Hafslund Energy (based in Oslo). Given this tendency of regionalisation of the production companies, one could expect that this would also trigger a more regional perspective on hydropower development.

### 5.2.2 The electricity-intensive industry

Traditionally the Norwegian state has subsidized the energy-intensive industry with long-term contracts for low-cost supply of electricity. As emphasised in Section 2, these contracts are now mainly expiring and many companies have concluded new, long-term contracts directly with the energy companies. The public subsidies are no longer viable as they are considered state aid, and thereby not in accordance with the EEA Agreement. However, the energy intensive industry in Norway still employs 270.000 people, and remains very important in many municipalities – not least in otherwise rural areas in Norway. The branch organisation assembling the energy-intensive, process and technology-oriented industry in Norway is *Norwegian Industry* (NI).

NI was established in 2006 when the Federation of Process Industries (PIL) merged with the Federation of Norwegian Manufacturing Industries (TBL). PIL was traditionally perceived as a major defender of the hydroelectric ‘faith’ (Knudsen et al. 2008: 261). In recent years, NI has also started to perceive energy production as an industrial possibility for its member enterprises, as reflected by a recent project managed by the former Minister for Petroleum and Energy, Åslaug Haga. A closer collaboration with Energy Norway in securing support for hydropowered electricity production has also emerged in recent years. Norsk Industri remains, however, mainly concerned with the cost of electricity to its producers, and is also a significant proponent of gas-powered electricity production. Hence, NI is generally critical towards the ambition of increasing Norway’s export of hydropower to Europe; and emphasises the importance of balancing the incumbent energy-intensive needs of industry with those of the electricity producers – including export potentials.

### 5.2.3 The Norwegian National Association of Hydropower Municipalities (LVK)

LVK is the interest organization of municipalities having ownership interests in hydropower installations. The LVK is a very important actor in the policy debates on hydropower in Norway, and is a major protagonist at the national level for providing a local perspective on hydropower production. On the one hand, LVK focuses on the optimization of revenues for the ‘hydropower municipalities’. In this regard, LVK is actively engaged in ensuring that the affected municipalities get what is considered as a rightful part of the benefits created by hydropower production. This is related both to new production, and not least in modifications in existing hydropower plants (refurbishment and upgrading, as well as revisions of granted licenses). On the other hand, the LVK promotes perspectives pertaining to other local economic interests and concerns not directly benefitting from hydropower development. In recent years, the LVK has increasingly broadened its perspective and engagement to encompass social and environmental concerns and interests. The LVK has been actively engaged in hearings concerning EU legislation to be implemented in Norway;

not least, the EU WFD and RES Directives, focusing on the consequences for hydropower producing municipalities.

#### 5.2.4 The environmental NGOs (ENGOS)

Energy-related issues are major concerns among the key Norwegian environmental NGOs (ENGOS). The ENGOS generally stress the need for renewable energy, but also see it as important to come to grips with consumption and to introduce energy-efficiency measures. While there are few substantial ENGO initiatives aimed at promoting renewable electricity production as such, the Norwegian environmental organizations have been almost unanimously in favour of a green certificate scheme in order to ensure a stronger promotion of renewable electricity production, including hydropower. However, there are differences in opinion when it comes to an actual follow-up, and hydropower projects still evoke a strong environmental engagement – particularly a critical one. Resistance towards hydropower constitutes, moreover, one of the historical reasons for the very establishment of the first environmental organisations in Norway (Berntsen 1994). Here the ENGOS differ in their orientation, with some being more concerned about the possible consequences for local landscapes and biodiversity.

The Norwegian branch of the Friends of the Earth (*Norges Naturvernforbund*), the oldest environmental NGO in Norway, stands out as the most critical ENGO to hydropower, and is increasingly arguing against small-scale hydropower (c.f. Haltbrekken 2007). The *WWF Norway* to a large extent shares the position of the Friends of the Earth, and has increasingly promoted critical comments towards hydropower development, stressing the importance of nature protection. This organisation is, however, increasingly focused on how to deal with climate-change mitigation, and is calling for more active political measures from the government, including for energy. In addition, there is the environmental foundation *Bellona* which is the environmental organisation most positive towards the development of renewable energy. Bellona has also explicitly stated that nature protection concerns must be less prioritised than climate-change mitigation in certain cases, in order to ensure that there is a shift from a fossil-based to a renewable economy (Hauge 2011). The environmental foundation Zero was established in 2002, by activists with background from, among other organisations – Bellona. Zero also shares many perspectives and interests related to renewable energy production with Bellona.

From a slightly different standpoint, the Norwegian Biodiversity Network (SABIMA) is an ENGO working to strengthen the protection of biodiversity in Norway. SABIMA is engaged in hearing processes and consultation on hydropower. SABIMA is in these cases most concerned about finding means which can safeguard the biological diversity. This often implies to be critical to larger projects as well as an increasing number of small-scale hydropower projects.

The environmentally based resistance towards hydropower is, however, most outspoken in relation to specific projects, and as such often more visible at the regional and local level than in the national debate. At the same time, there is also a tendency that ENGO's, locally and regionally, engage more in wind power- and

grid- related projects and issues, than in hydropower. This happens despite a significant growth of small-scale projects.

### 5.2.5 NGO's for outdoor recreation

In addition to ENGO's , there is also a number of organisations which often operate in favour of environmental interests, but which also promote economic and social interests related to the use of nature. A prominent representative of these interests is the Norwegian Trekking Association (*Den norske turistforening*; DNT), being 'Norway's largest association for outdoor activities' with about 240.000 individual members, and established already in 1868. DNT owns and maintains a number of cabins and trekking routes in the Norwegian mountains. The organisation has also been an active protagonist for the protection of watercourses – which are perceived as important parts of the landscape and the outdoor recreation experience.

The Norwegian Association of Hunters and Anglers (*Norges Jeger- og fiskerforbund*; NJFF) is also an important protagonist for the outdoor recreation interests. In parallel with the DNT, these are pertaining both to economic and social interests – in addition to the environmental protection interests. The organisation has 120.00 individual members, and 520 local clubs, and was established in 1871. The local clubs have also been active participants – both historically and currently – in debates and consultations on hydropower projects, specifically focusing on the consequences for fish species – not least the salmon.

The DNT and NJFF participates together with Friends of the Earth Norway and WWF-Norway in the Council for cooperation for nature protection (*Samarbeidsrådet for naturvernsaker*; SRN). The council often puts forward hearing comments in public consultations on specific hydropower projects.



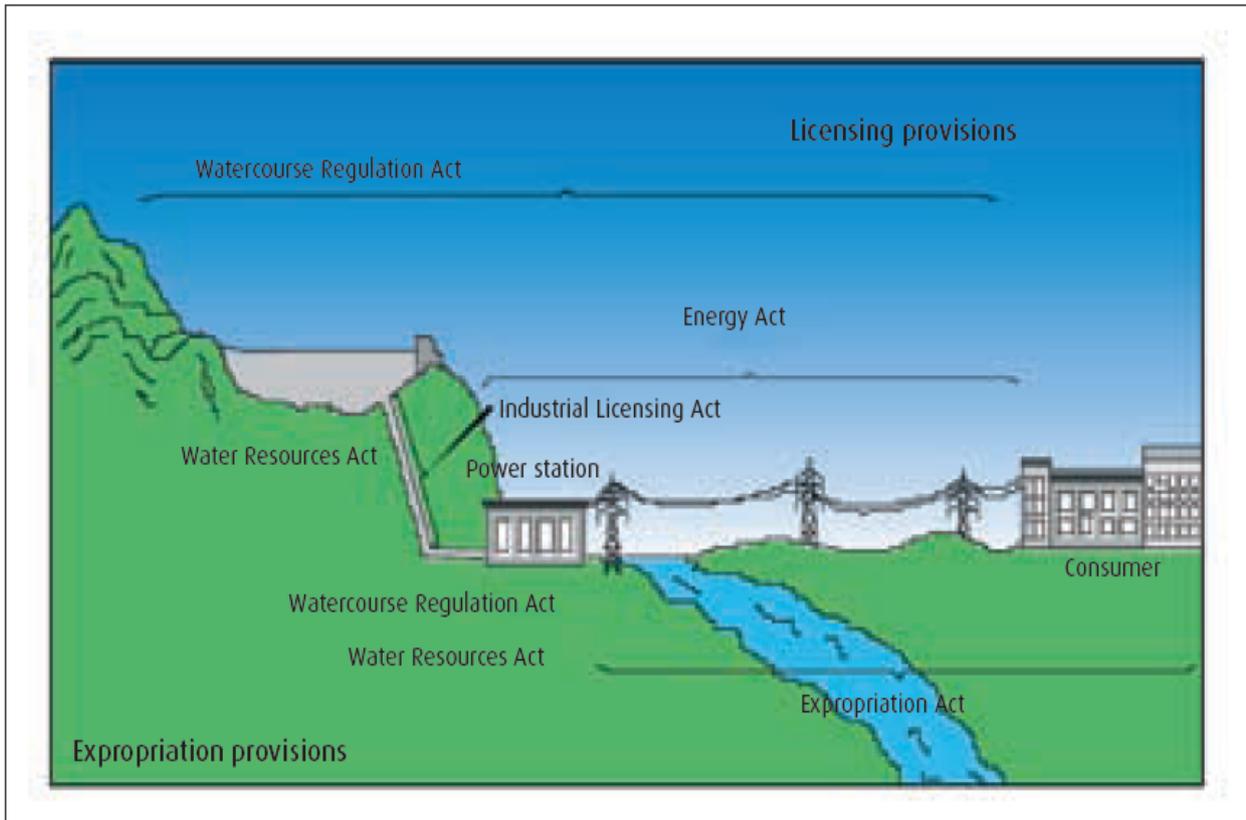
## 6 Framework plans and licensing processes for hydropower

Public management of watercourses has a long tradition in Norway, starting with legislation in 1887, which is still valid – albeit revised and amended several times. Thus, the political and legal framework for hydropower is significantly rooted in historical processes, by legislative principles and practice characterised by various historic periods (see Angell and Brekke 2011). From the 1970's onwards, there have been successive versions of a Protection plan, as well as an overall Master Plan for watercourses. The present section will provide an overview of the major features of the formal framework for licensing of hydropower, including the major legal acts pertaining to hydropower – and outline the major procedures and requirements.

As emphasised in Section 1, the range of options for further hydropower development in Norway has become more limited. In addition, existing hydropower production will increasingly be subject to revision of terms of the granted licenses. In this regard, a main distinction can be drawn between the cases of new hydropower (small- and large-scale), on the one hand; and the refurbishment/upgrading of existing installations, as well as revision of existing licenses on the other. Therefore we discuss these two main categories of cases in two different sub-sections below (5.3.1 and 5.3.2).

### 6.1 The legal framework for licensing of hydropower

A number of legal acts and regulations apply to different stages of initiating, planning, licensing and revision of hydropower projects. The most essential are the Industrial Concession Act, the Water Regulations Act and the Water Resources Act. In addition, the Planning and Building Act applies for the localisation of the hydropower plants above a certain size level, as well as additional installations and infrastructure. The Energy Act regulates the technical installations related to hydropower production, including the connection to the grid. In addition to the role played by the NVE and other public authorities at the national level, both the municipalities and counties are provided with the mandate of managing overall objectives and principles for affected areas and the relevant land-use within their jurisdictions. Regional and local assessments substantially influence the potential for existing and future hydropower projects. In addition to the laws outlined below, there are specific regulations related to expropriation (the Expropriation Act) and related indemnities and compensations for the use of land for hydropower installations. Figure 4 below provides a schematic overview of the legal acts which will be presented in the present section.



**Figure 4:** An oversight of the relevant regulations pertaining to hydropower licensing. The acts illustrated above will be further elaborated below (except the Expropriation Act). Illustration from MoPE (2008a).

The legal acts presented below constitute the formal framework and procedures for licensing new hydropower production, as well as revising and modifying established conditions and terms in already granted licenses. As will be emphasised in Sections 5.3.1 and 5.3.2, the licensing processes are also impacted by the promotion of different interests and concerns, as well as the trade-off between these, which again is substantially based on documentation and knowledge.

### 6.1.1 The Industrial Licensing Act

The Industrial Licensing Act of 1917 was formulated to ensure a continued national ownership of Norway's important hydropower resources. The act prescribes to 'whom' and for 'how much' the power plants can sell their resources. According to this act the Norwegian state takes over, free of charge, any waterfall or hydropower installation when a license expires (right of reversion). This regulation does not, however, restrict the power producers' ability to invest in and improve the plants. According to the law, the acquisition of rights of ownership to a waterfall by others than the State requires a license, if it is assumed that the waterfall can provide an output exceeding 4,000 natural horsepower (2,944 kW) after regulation. This threshold implies that small-scale hydropower is not encompassed by the act.

The conformity of the act with the EEA Agreement was questioned by the EFTA Surveillance Authority (ESA) in the early 2000's. This had to do with the principle of guaranteeing reversion of ownership to the state. The case was taken to the EFTA Court, and in June 2007 it was decided that Norwegian authorities had to amend the principles in the act so as to ensure an equal treatment of public and private owners. It was clear from the Norwegian reactions to the EFTA court judgment that national, and preferably public, ownership still is considered as decisive for the majority of politicians at the national and local levels.

Building on this, the Parliament adopted an amended legal act in 2008, which implemented the ruling of the EFTA Court. This resulted in a affirmation of the principle that Norway's hydropower resources belong to the general public and must be administered to the public's best interest. This is to be achieved by an ownership structure based on public ownership on the central, county and municipal levels. Therefore, new licences for acquiring waterfalls may be granted only to public-sector owners, and acquisition of reverted waterfalls and power plants is restricted to public-sector operators. No renewal will be granted for private entities' expiring licences. According to the amended law, the sale of more than one third of publicly owned waterfalls and power plants to private entities is now prohibited. The current licences of limited duration that revert to the State on expiry will run normally until the reversion date. The last major reversion will occur in 2057.

The Industrial Licensing Act also includes mandatory terms relating to licence fees and the obligatory sale of power to the municipalities in which the waterfalls are situated. These provisions entitle the municipal authority, alternatively the county authority, to buy up to 10 per cent of the power generated at cost. The act also authorises the introduction of further conditions relating to environmental considerations and the local community, including the establishment of local industrial funds. These rules are seen in relation to the rules stemming from the Watercourse Regulation Act, which is presented below.

### **6.1.2 The Watercourse Regulation Act**

This act was originally adopted in 1917. The Watercourse Regulation Act stipulates requirements and conditions for the hydropower plant as to the establishment and usage of water reservoirs. Such reservoirs are necessary in order to regulate the water currents with effect for the electricity production. The act stipulates measures that can even out the hydropower production through annual cycles, by setting specific terms for the regulation of water currents as part of the hydropower production.

The Watercourse Regulation Act applies to all planned installations, as well as changes in existing installations, with an effect exceeding 500 horse power (368 kW) in one specific water fall, or 3000 horse power (2208 kW) for the whole watercourse (Watercourse Regulation Act § 2). In addition, however, projects not exceeding these limits can also be comprised by this law if the water regulations concerned are considered to influence the natural environment or public interests in a substantial manner (ibid.). In addition, a way of considering the application of the Watercourse Regulation Act is also the amount of power production stipulated by the planned project; if the annual, average production is to exceed 40 GWh,

the project owner must obtain a license based on the Watercourse Regulation Act (NVE 2010: 8). Generally, all cases that are considered as included by this act are also to be considered according to the Water Resources Act (see below).

As part of the license, the NVE also sets specific terms for the management of the hydropower plant, based on the application. These are related to the revision of the license, license fees, compensatory measures (like local industrial and environmental funds), and other specific concerns. In particular, such terms include rules on how the plant is to regulate water discharge, water flows and the related consequences for water levels in the concerned watercourse. Some of these measures are based on the Standard conditions.

### ***Standard conditions***

Mandated by the Watercourse Regulation Act, the standard conditions include – among other things – erosion protection, and the construction of thresholds in the watercourses in order to regulate the currents. Moreover, the conditions encompass investigations and assessments of the concerned biosphere, as well as the issue of regulating the fish stock (including eventual requirements on adding fishes), the protection of cultural heritage sites and other things. The majority of the standard conditions are directly based on the law, whereas others have been added – also reflecting new insights and knowledge. The application of the Standard conditions is also based on concrete cost-benefit assessments in the projects concerned. This implies trade-offs where the actual outcome and the eventual application of the standard condition are not given in advance.

The application of Standard conditions implies an obligation for the project owner to follow up. The Standard conditions can furthermore be employed in relation to revision of granted licenses. The time frame for such revisions depends on the period where the original license was granted. In Section 5.4.1 below, we elaborate further on the system for revising terms and conditions related to granted licenses. The NVE intends to base the revisions as much as possible on the use of the standard conditions (NVE 2010b). In this perspective, the Standard conditions particularly represent a tool for reinforcing the environmental standard and performance of hydropower production in Norway. However, the guidelines for revision of licenses are still not formally approved (see below). By related requirements on documentation, the standard conditions are also important as a way of stimulating and contributing to the knowledge-building for hydropower in Norway. Although the standard conditions imposed on specific projects, as well as the related documentation, are publicly available, no overall assessment of the effect of the standard conditions have been conducted.

### **6.1.3 The Water Resources Act**

The *Water Resources Act* entered into force in 2001 and stipulates rules for interventions and constructions affecting Norwegian watercourses. The law replaced the former *Watercourses Act*. A main objective of the act is to promote sustainable development and to maintain biological diversity and natural processes in river systems. The Water Resources Act stipulates provisions for the use of the watercourses, and for planning and

implementation of works in them. All physical interventions and new constructions in the watercourses must be granted a licence from the Water Resources Act. Small-scale hydropower installations are mainly regulated by the Water Resources Act, whereas large-scale hydropower must obtain license from the Watercourse Regulation Act as well. This is also due to the use of water reservoirs. Projects not implying reservoirs are generally considered on the basis of the Water Resources Act only. The main criterion for granting hydropower plants license according to the Water Resources Act is that the benefits are perceived as greater than the damage or the inconvenience to the public and private interests. ‘Public interests’ are interpreted widely, and may include nature protection, outdoor recreation, the landscape, fish stocks, cultural artefacts, economic activity and local communities.

The law also mandates the application of a number of conditions to compensate for and mitigate the adverse impacts of developments in the river systems. Based on this, during the processing of a license application, the applicant may be required to pay for investigations and studies needed to identify the advantages or drawbacks of the project. The natural and biological aspects of the watercourse – both related to the watercourse as a landscape element, and habitats for plants and animals – are specifically focused by the law, and the documentation mandated by the law. Hence, the act mandates rules on the minimum release of water, and the protection of waterside vegetation. However, the act mainly regulates the watercourse itself, and not the surrounding landscape.

Hence, in addition to the measures mandated by the Watercourse Regulation Act and the Standard conditions, the NVE can also employ the Water Resources Act as a basis for imposing environmental measures in watercourses. Assessments according to the Water Resources Act provide a specific priority of the salmon, particularly in relation to projects situated in the national salmon watercourses (see below). An emerging concern from the environmental side is, however, the management of the river banks and surrounding areas and landscapes given the lack of focused regulations protecting these areas.

#### **6.1.4 The Planning and Building Act (PBA)**

The PBA contains specific provisions for the localisation and the disposal of areas affected by hydropower installations. The municipalities hosting a hydropower facility generally issue an authorization for the use of land and a permit according to the municipal land use planning. From 2009 an amended PBA entered into force, by which the requirement of municipal planning and approval is modified. That is, hydropower installations having been granted license according to the Watercourse Regulation Act, the Water Resources Act and/or the Energy Act, are no longer required to be comprised by a local plan (MoE 2009b: 4). This amendment has been decided in order to alleviate the requirements associated with the preparation of an application for license, and avoid the traditional, two-track approach; the one stipulated by the energy and water-specific legislation, and the one pertaining to the PBA and rules for land-use. The municipalities are, however, delegated with the authority to formulate eventual local plans related to the installation, if they want to detail the project further (ibid.).

### ***Impact assessments (IA) as prescribed by the PBA***

For larger hydropower installations there are specific rules requiring extensive impact assessments (PBA, chapter 14). The requirements for impact assessments are further specified in a specific Regulation on impact assessments (MoE 2009a). The steps taken as part of an IA process are in many ways the core process of a license application and licensing process, for larger hydropower projects. The process described within this section, therefore, partly overlaps with the steps outlined in Section 5.3 – related to the licensing of small- and large-scale hydropower projects.

The hydropower projects committed by the IA regulation are primarily those with a potential production at 40 GWh or more; and installations pertaining to dams or permanent storage of water where the stored water exceeds 10 million m<sup>3</sup>. If upgrading and refurbishment imply substantial changes at the level listed above, the same requirements for impact assessment will apply. In addition, hydropower stations with a production output exceeding 30 GWh should always be specifically considered in order to decide whether there should be made an impact assessment according to the Regulation.

In advance of the application of the IA procedures the project owner must submit a draft notification of the project plan to the NVE. The NVE then considers the quality of the plan, and based on the NVE's comments the project owner formulates its final notification which is forwarded for a public consultation among stakeholders and affected parties, including the relevant authorities at different levels (NVE 2010a). Based on the notification, and as part of the hearing, the NVE convenes a public meeting in the local community affected by the announced project. On this basis, the NVE formulates a programme for the impact assessment. In addition to requirements for the assessment of the actual impacts of the project itself, the IA programme will also stipulate what alternatives are to be further assessed by the project owner. In the event of an assumed conflict of interests with other national objectives and concerns, the NVE is required to get the approval from the Ministry of the Environment on its proposal for an IA programme (ibid.).

The applicant is then committed to follow up the IA programme defined by the NVE. When the IA programme has been completed, the applicant formulates the application for license to the NVE together with the IA documentation. NVE then forwards the application on a public consultation process, not least including the affected national, regional and local authorities, as well as affected interests and stakeholders. Related to the comments posted during the hearing, NVE assesses the related documentation and considers the need for additional assessments from the applicant. In addition, the applicant is invited to comment upon the comments received during the hearing. After the closure of the hearing, the NVE convenes a final inspection of the site for the hydropower project. If additional assessments are required, these are forwarded as part of an additional new hearing. In addition to the formal check points, there are also, generally, ongoing consultations as part of the preparation and follow-up of inputs related to the assessments and the project itself; between the applicant and the NVE – as well as between the NVE and other public authorities.

The NVE's recommendation and draft license is forwarded on a new hearing before it is handled by the MoPE. This hearing primarily involves public authorities; i.e. concerned ministries, agencies, counties and

municipalities. The applicant also has the right to comment upon NVE's recommendation. Based on the impact assessment, related documentation and the application document itself, the NVE conducts the final processing of the license application. NVE draws a preliminary conclusion which functions as a recommendation before the case is handed over to the MoPE. The MoPE conducts an assessment based on the recommendation from the NVE and the related documentation, as well as considering the case in relation to relevant policy objectives and legislation. The MoPE then prepares the final stage within the Government, and the decision to be made by the King in Council, or by the Parliament.

### 6.1.5 The Energy Act

The Energy Act, adopted in 1990, establishes the organisational framework for Norway's power supply system. In particular, the law represented the formal step by which Norway became the first country in the world to allow customers to freely choose their power supplier, as well as initiating the deregulation and integration of Norwegian hydropower into what later became an international market structure; NordPool. The Energy Act regulates and provides the basis for licenses for construction and operation of energy installations, albeit differentiated for production and grid, as well as different production technologies. This also applies to all electrical installations and facilities required for hydropower stations. Hence, in connection with the construction of hydropower stations, the developer must apply for separate construction and operating licenses according to the Energy Act. Such licenses are granted directly by the NVE.

### 6.1.6 Relevant environmental regulations

#### *The Water Regulation: Norway's follow-up of the EU Water Framework Directive (WFD)*

The Water Regulation ('Vannforskriften') was adopted in late 2006 as Norway's main follow-up instrument of the EU WFD, and entered into force on 1 Jan. 2007 (MoE 2006). The EU WFD was finally adopted by the EU in 2000. Negotiations on the inclusion in the EEA Agreement were protracted, and Norway decided to start the implementation of the Directive in 2006, by focusing on 29 pilot areas. Norwegian authorities thereby aimed at coordinating their initial follow-up (through 'the first phase') with the common EU implementation, and thereby be able to participate in what was termed the 'common European learning process' (Vannportalen). This initial phase is, however, not part of Norway's formal follow-up, which is constituted by the next planning phase which is to be coordinated with the second phase of the EU implementation; that is, 2010-15. Hence, a complete picture of the effect of the WFD in Norway will be available by 2014-15.

The Water Regulation defines the roles and responsibilities for the various governmental agencies, not least the areas of responsibility of the Ministry of the Environment, including the DN, vis-à-vis the other sectoral authorities. In line with the prescriptions in the EU WFD, the focal point is the formulation of environmental quality objectives; mainly related to biological factors and chemical conditions in the watercourse. A major objective of the WFD is to identify watercourses where constructions or operations have affected the ecological status (OJEC 2000). In such cases, one speaks of 'highly modified watercourses'; for which the

objective is to achieve ‘good ecological potential’; as distinguished from a ‘good ecological status’ for ‘purer’ watercourses (ibid.). According to the Water regulation (§ 5) and the formal interpretation of this, most Norwegian watercourses with larger hydropower installations are considered as highly modified watercourses (MoE 2006; Vannportalen.no).

The Water Regulation establishes and defines the boundaries of the various water regions in Norway, as well as the set-up and roles of the institutional bodies that are to govern the follow-up. These bodies include regional management committees, and related work and reference groups. Initially, there were 9 water regions (‘river basin districts’) in Norway. The regions are to develop management plans for the whole river basin district, as well as programmes of measures for more delimited stretches of specific watercourses. The number of regions was in 2010 adjusted in order to delimit more precisely some of the watercourse areas at the Western coast of Norway. Furthermore, a revised Water Regulation from 2009 transfers the formal responsibility for the WFD at the regional level from the County Governor (the Government’s representative at the county level) to the County Councils’ administration. A main finding from recent Norwegian research on the follow-up of the WFD is that the actual organisation and network constellations as to the follow-up of the water management plans vary substantially from region to region (Indseth et al. 2010: 9). How this variation actually can impact on hydropower remains a question for further research.

In 2009, the river basin management plans (regional plans) for the original 9 water regions, together with the program of measures for all the 29 pilot areas, were approved by the respective county councils, and then forwarded to the Ministry of the Environment. The plans were finally approved by the Government in June 2010 (MoE 2010). An important part of this approval was the firm statement that all measures stipulated by the plans must be based on the sectoral legislation, and the sectors’ management of this. This means that licences for hydropower, including revisions, is to be conducted as before, although they must take the regional water management plan, and eventual programme of measures, into account (MoE 2010; NVE 2010b). There is, furthermore, an explicit statement saying that the regional plans can include a proposal for a future state of the environment which can imply a changed minimum release of water in the watercourse (MoE 2010). Environmental quality objectives set for regulated watercourses as part of the first 6 year cycle in the WFD follow-up are, however, to be based on existing terms set by the current licenses. Eventual revision of the terms of licenses is, therefore, to be decided by the licensing authorities (ibid.).

The mapping and assessment of the concerned watercourses in relation to the pilot phase has in the majority of cases concluded that the watercourses substantially affected by hydropower development are considered to be highly modified watercourses. 8 of 9 regional plans stipulate environmental objectives and mitigating measures implying modifications in the water regulations. This again, implies revisions of the terms and conditions set through the licenses for the hydropower plants. Since such measures must be formulated by the licensing authorities; that is, the NVE and the MoPE, the regional plans and programmes of measures refer to ongoing and planned processes of revising the licenses.

In the case of the regional management plan for Møre and Romsdal, on the north-western coast of Norway, one has included a watercourse heavily impacted by hydropower; that is, Aura. Aura is currently also undergoing a revision of terms in the license. The Regional management plan stipulates that an outcome requiring the hydropower producer to implement a minimum release will be a substantial contribution to the fulfilment of the environmental objective for the watercourse (Møre and Romsdal Water Region 2009). Furthermore, the DN affirms that this case is significant, both by its size, and the possible precedence for similar, coming revision cases (DN 2009).

Another case where the connection between hydropower and the follow-up of the WFD has been explicitly focused, is the Vefsna watercourse in Nordland county in Northern Norway. Vefsna was classified as protected watercourse as part of the last supplement to the Protection Plan, as approved by the Parliament in 2009 (see above). As part of this protection status, the Parliament also decided that Vefsna was to be one of the pilot watercourses in the WFD follow-up. In addition, Vefsna was to represent a test case for a more coherent planning of water resources, particularly since the watercourse still can accommodate small-scale hydropower plants. The work on this plan is still not finalised.

### ***The Biodiversity Act***

The Act on Biological Diversity was adopted in 2009, and also constitutes Norway's follow-up of the international Convention on biological diversity. The act stipulates measures to protect the biological diversity and manage biological resources in a sustainable way. The main objective of the law is to preserve diversity with respect to biology, landscape and geology, as well as ecological resources in the nature – and the sustainable use of these. The law also contains provisions as to demand appropriate assessment of consequences for the nature of diverse projects and measures – like hydropower, as well as the possibility of halting projects if the knowledge about eventual consequences is assumed to be insufficient. The DN is mandated with the national responsibility of following up the act. As the sectoral authority with responsibility for hydropower, the NVE is responsible for following up the law in relation to hydropower development. Currently, the Ministry of the Environment is formulating guidelines for the follow-up of the law.

Based on the act, provisions for protecting individual species have also been formulated, like action plans for 'red listed' (particularly endangered) species. For hydropower this is specifically related to freshwater mussels, eels and salmon. For salmon there is a dedicated protection regime (see below). Building on the action plans, regulations for specific species as a means to provide a legally based protection of the most endangered species, are currently under preparation. The Atlantic salmon will not be included in these regulations, since there is a specific protection regime already in place for this specie.

Two important principles enacted by the law with a potential impact on further hydropower development has recently been emphasised by the Ministry of the Environment (Sørensen 2011): This is the act's statement of knowledge-based decisions; all decisions affecting biodiversity must be based on scientific knowledge, as well as local and other experiences related to the management of nature. Secondly, the precautionary

principle should apply when the lack of knowledge implies a specific caution in order to avoid (unforeseen) significant damages on the biodiversity. Furthermore, if there is a risk of serious or irreversible damage on the biodiversity, the lack of knowledge can not be employed as a reason for the postponement or non-implementation of mitigating measures.

It is required that hydropower developers and project owners check the documentation available for their area, as well as conducting an assessment of the possible risks for biodiversity, both landscape, ecosystem and particular species. National databases aggregating such data and documentation are available, but it will be an ongoing work – also requiring additional resources and funding – to maintain and supplement this knowledge basis.

### ***The 'protection regime' for salmon***

Hydropower can impact the wandering stock of Atlantic salmon. Mitigating measures related to salmon are included as Standard conditions in new licenses, as well as updated conditions in revised licenses (or parts of licenses). In addition, from 1992 there is also an *Act on Salmon and Inland Fish Stocks*, managed by the MoE.<sup>4</sup> The act is furthermore supplemented by particularly protected 'national salmon watercourses' and 'national salmon fjords' (St.prp. 32, 2006-2007). In particular, according to this law hydropower producers are required to prevent damages of the living conditions of the salmon. The Act on Salmon and Inland Fish also constitutes Norway's follow-up of its commitments under the *Convention for the Conservation of Salmon in the North Atlantic Ocean*. The convention commits all countries that dispose of North Atlantic salmon stocks to protect the specie. The signatory countries have agreed upon common guidelines for the management of wild Atlantic salmon, based on the precautionary principle. In Norway, the parliamentary majority has emphasised Norway's particular responsibility for the North-Atlantic wild salmon, and the commitment to be a leading nation in this field (Committee recommendations 183, 2006-07).

MoE and the DN have the overall responsibility for the salmon protection regime, but coordinate the follow-up from the various sectoral authorities. MoPE and the NVE have the sectoral responsibility for integrating salmon protection concerns into hydropower licenses. Specific salmon- and inland fish-related conditions for hydropower are set in the licenses according to the specific hydropower legislation; the Water Regulations Act and the Water Resources Act. In relation to such conditions, the hydropower operators can be committed to conduct updated short- and long-term analyses of salmon- and fish-related impacts. In relation to the formulation and establishment of specific mitigating measures the DN and the nature management authorities at the regional level (the County Governor) are mandated to check the correct employment of relevant legislation and regulations.

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<sup>4</sup> Although being a quite recent legislative act, the law has substantial historical roots. The first specific law related to the fishing of salmon was adopted in 1848, and a common law on both salmon and inland fish was adopted in 1964. An amended legislation on salmon and inland fish was then adopted in 1992. The amended law from 1992 is characterized by the concerns for nature protection and the possibility of limiting salmon fishing, whereas the 1964 law contained few provisions for such limitations.

Based on the Salmon and Inland Fish Act, the Parliament has adopted a specific protection regime related to specific watercourses and fjords. In these areas operations and constructions that are considered as harmful for the salmon are prohibited. This includes the consequences of aquaculture and related diseases, and other environmental impacts (St.prp. 32, 2006-2007). This regime is to ensure that the most important salmon stocks are given a specific protection of both living and migration areas and patterns.<sup>5</sup> The majority of the national salmon watercourses were already protected as part of the hydropower Protection plan. This implies that large-scale hydropower development is not feasible within these watercourses, whereas small-scale hydropower below 1 MW is permitted – as long as that the consequences for the salmons are not considered to be too harmful (St.prp. 32, 2006-2007.).

In a number of recent cases of licensing processes, concerns related to the protection of the Atlantic salmon have constituted important parts of the consideration and trade-off. Other inland fish species are generally not highlighted to the same degree. Accordingly, the knowledge related to other inland fishes is far more limited than for salmons.

### ***INON***

The DN has the responsibility for mapping remaining areas without human constructions in Norway, and defines an index termed ‘INON’ (‘INON’ as an acronym of the Norwegian term). The INON mapping and index reveals consequences of the construction of infrastructure, not least related to energy production and distribution; both physically (including landscape) and biologically. This index is communicated to the political decision-makers, being based on general policy objectives of stronger protection of the remaining, pristine areas. It is expected that public authorities and agencies take account of the INON index and make necessary adjustments in order to protect these areas. The INON index is integrated into the guidelines for the assessment of small-scale hydropower (see below), and are therefore to be taken into account by the NVE in its licensing. INON must also be highlighted as part of the impact assessments conducted for large-scale hydropower, according to the PBA.

## **6.2 A national planning framework for hydropower**

### **6.2.1 The Master Plan for watercourses**

The first version of the Master Plan was adopted by the Parliament in 1986, and later updated in 1988 and 1993. The objective of the Master plan was to provide a mapping and assessment of all potential hydropower projects and stipulate priorities vis-à-vis further development and actual realisation. The mapping and assessment were related to economic and technical feasibility, and environmental impacts of potential hydropower projects. This mapping has also been employed as a ‘pre-selection’ mechanism pointing out projects ‘eligible’ for eventual licenses. The background for the plan was particularly related to

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<sup>5</sup> The ‘salmon protection regime’ is considered as permanent, but is to be evaluated after 10 years in order to assess the need for updates of the regulations (by 2016-17).

the controversies surrounding hydropower development, not least the strong conflict about the development of the Alta watercourse in Finnmark, Northern Norway, in 1979-82.

The process preceding the adoption of the Master plan included a mapping of all potential hydropower projects including the priorities vis-à-vis further development and actual construction. This implies a systematic sorting of hydropower *projects*, and does not provide specific requirements for the watercourses as a whole – in contrast to the protection plans. The Master plan contains a categorisation of the different watercourses and the related feasibility for hydropower development. The division into categories of projects was initially based on the assessment of various user interests and the project economy. In the beginning there were three categories which were reduced into two in 1993. The projects with the most limited conflict potential are placed within *category 1*, whereas the most controversial and economically expensive projects are placed within *category 2*. It is possible to transfer projects from one category to the other, as well as promoting alternative projects. A project within category 1 is pre-qualified for the consideration of license, although a final license is not guaranteed. A project within category 2 means that it is not clarified for licensing.

From 1993, updates and consideration of new and continued projects are only treated administratively. The responsibility for this has been delegated from the Ministry of the Environment to the DN. Decisions pertaining to the status of the projects included in the Master plan are taken by the DN, in close dialogue with the NVE. Based on the Master plan, the NVE also manages and updates a list of the most realistic and available projects. However, the current version of the Master Plan is generally known to be insufficiently updated. The delegation of this responsibility from the ministerial level towards the agencies may also be considered in relation to the reduced significance of the plan.

The management and updating related to the Master plan is often focused on exceptions or transfers of projects from one category to another. Exceptions are related to the projects where it is likely that a full licensing process would have resulted in an inclusion in category 1. Most transfers of projects occur from category 2 to category 1, in order to prepare for a licensing procedure. The most prevalent reasons behind such transfers are the amendment or omission of the most conflicting parts of the project. New projects and upgrading most often imply new assessments within the framework of the Master plan. However, projects with less than 10 MW installed capacity are now exempted from the Master plan, and the NVE can proceed directly with the licensing procedures for small-scale hydropower projects.

Another important dimension of projects related to the Master plan is the connection with the Protection plans. Related to this an eventual re-structuring of the Master plan in parallel to a restructuring/revision of the Protection plans has been considered, as well as the possibility of transferring the most controversial watercourses in the Master plan to the Protection plan. Most of the relevant projects in this regard are included in category 2 (not available), but some (environmentally) controversial projects are also positioned within category 1 of the Master plan – mostly due to the political process and the Parliament's follow-up of the proposed plan.

The Parliament decided in 1993 to introduce a revision clause every 4 – 6 years, with a specific view to the energy balance, but this has thus far not been followed up. Furthermore, several white papers adopted by the Parliament at the end of the 1990's and the early 2000's concluded that there should be a broad revision of the Master Plan, in order to incorporate new regulatory provisions such as salmon- and fish-related protection, as well as the EU Water Framework Directive (WFD). In this respect, an important perspective on the further development of the Master Plan has been a transition from 'formalised clarification mechanism' for licensing of individual hydropower projects, towards an updated assessment of watercourses (Thaulow et al. 2008: 26). A revision of the Master Plan following these lines is still not put forward by the Government.

## 6.2.2 The Watercourse Protection Plans

The Parliament adopted four protection plans between 1973 and 1993, and a final supplement in 2009. The protection plans contain binding instructions to the authorities not to license regulation or development of certain watercourses for the purpose of hydropower generation. When evaluating which watercourses to protect, importance has been attached to preserving a representative selection of Norwegian river systems. Outdoor recreation also represents important concerns and interests when considering protection. As shown in figur 2 in Section 2, a total hydropower potential of about 45.5 TWh per year has been protected.

The fourth protection plan was finalised in 1993. By the adoption of this plan the Parliament considered the protection planning framework to be completed. This decision was, however, challenged by new political concerns emerging towards the end of the 1990's, not least a reinforced priority of nature protection, not least the overall political signal stating that the end of the epoch of large-scale hydropower projects in Norway was over (c.f. St.meld. 37, 2000-2001).

The Prime Minister's statement was reflected in the supplementary Protection Plan which appeared in 2001, focusing on supplementary protection of watercourses. Not least important, the Government here proposed to reject further development of the important Saltfjellet-Svartisen area in Northern Norway, implying the cancellation of a number of stipulated hydropower projects (Beiarn, Bjøllåga og Melfjord), planned by Statkraft. This triggered a fierce policy debate, since these cases were the only concrete projects mentioned in this White Paper. In addition, the document provides several more principal statements, affirming that the Government will prioritise the protection of pristine nature stronger when considering new hydropower projects. This overall signal represented a political shift, not least for the Labour Party – which traditionally has been a strong proponent for further hydropower development as a means for industrialisation and further economic growth. The major reason for the cancellation of the projects in Northern Norway was the Government's perception of a stronger resistance from protection interests. In spite of a generally more restrictive attitude towards hydropower the Government in this plan signals a more positive attitude towards refurbishment and upgrading – as far as such projects do not harm pristine nature.

The adopted supplementary plan provides the opportunity for licensing projects in the remaining watercourses, as long as environmental concerns are considered more substantially than before – building on the Government’s former signals. The supplementary Protection Plan was initially intended to be presented alongside an updated Master Plan as well as recommendations on national salmon watercourses. The complexity and controversy surrounding these issues led, however, to delays – and therefore only the Protection Plan was presented at this stage. In relation to the preparation of the supplementary Protection Plan, the Parliament also decided to permit the licensing of micro and mini hydropower plants (up to 1 MW installed capacity) in protected watercourses.

However, in this presumably last protection plan – adopted in 2005, one important watercourse in Northern Norway was not included. The watercourse Vefsna had been surrounded by much controversy, and local and national actors had both promoted and opposed further hydropower development. A side-effect of the Parliament’s 2005 decision was to assess the possibility for a combined protection and exploitation limited to small-scale hydropower of Vefsna. In order to prepare the final decision concerning Vefsna, the supplementary protection plan was not completely finalised in 2005. The political consideration on Vefsna led to a new supplementary proposal in 2009 (St.prp. no. 53, 2008-09).

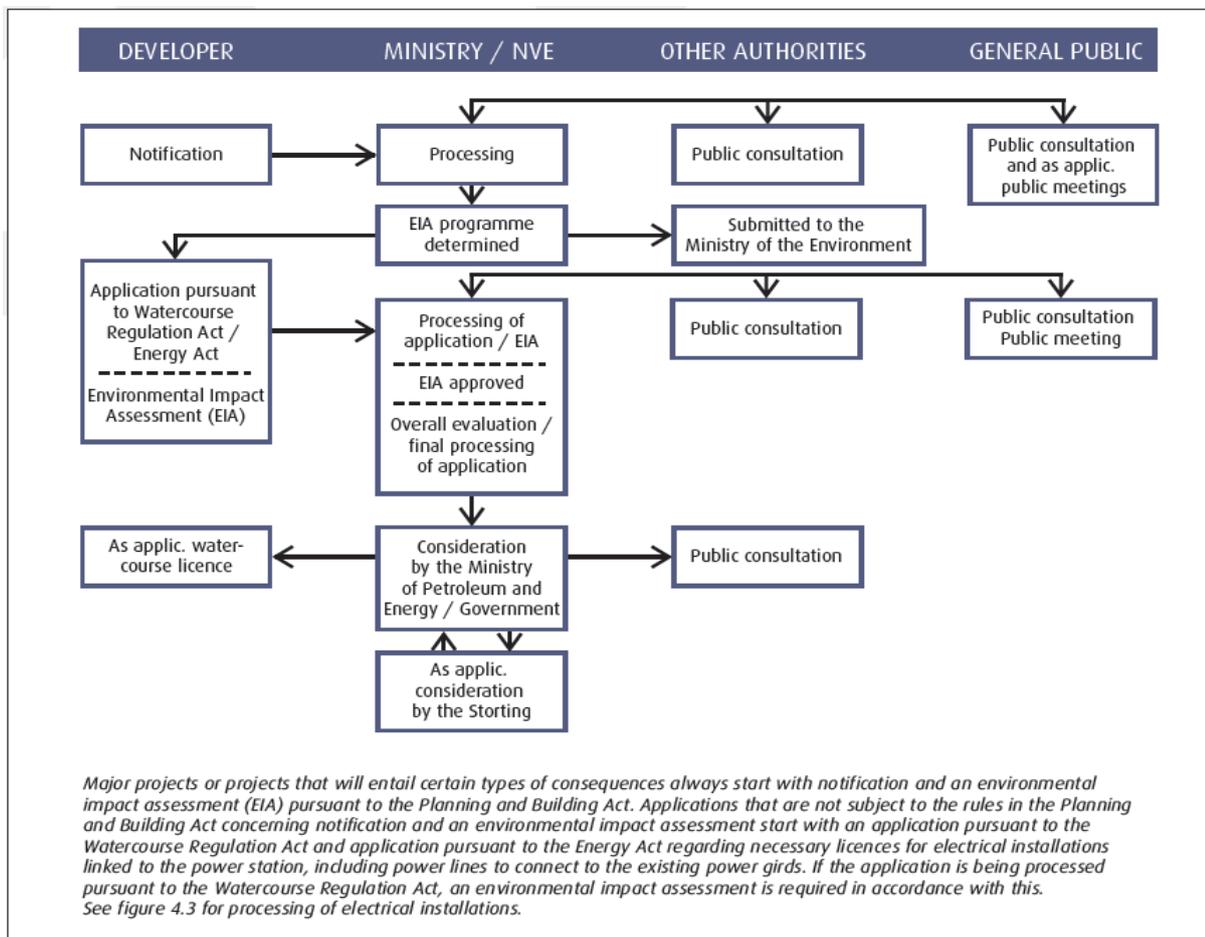
Hence, an additional, and thus far – final, supplement to the Protection Plan was adopted in 2009 including the decision on protecting Vefsna. This decision was also stipulated by the governing coalition’s statement of accession from 2005, building on the parliamentary majority. As part of this supplement, the parliamentary majority also decided that Vefsna was to be seen as a pilot case for coherent water planning and management in the follow-up of the Water Framework Directive. Included in this, the Parliament decided to exempt Vefsna from the general limit of 1MW for hydropower in protected watercourses. A follow-up strategy has been expected for a while, but is delayed by the process between the county administration and the MoPE/NVE. Including in this, there will be a consideration of how to follow up and manage the decision on licensing hydropower projects larger than 1 MW of installed capacity.

### 6.3 Licensing of new hydropower production

Building on the overall framework, as constituted by the Master and Protection plans, this section focuses more concretely on the main procedures pertaining to the licensing of new hydropower. There are, however, major differences in regulation of large- and small-scale hydropower plants, respectively. The former require licenses according to the Water Regulation, Water Resources and Energy Acts, whereas the latter category generally only requires license based on the Water Resources and Energy Acts, or no license at all. For both categories the Planning and Building Act and the provisions on impact assessment can also apply – depending on the size and impact of the installation. The licenses are granted from the licensing authorities which are also responsible for managing and processing the license applications. As described above, in addition to the NVE, these authorities also include the MoPE, the Government/King in Council, and the Parliament. Licenses pertaining to the Watercourse Regulation Act (large-scale hydropower) will normally require an affirmation from the Government, and in particular cases the Parliament. Small-scale hydropower,

mainly regulated by the Water Resources Act, is generally granted license directly from the NVE. The major steps in licensing of hydropower are illustrated by Figure 5 below.

An important underlying principle for the licensing of hydropower is that all affected concerns and interests – both those benefitting from, and those having inconveniences from the construction – must be included within a coherent assessment. ‘General interests’ like the environment, climate change, landscape, outdoor recreation, other industries, the local society and national interests, must all be taken into consideration (Buan et al. 2010). In addition, other concerns and interests, like emergency preparedness and more particular interests, must be appropriately assessed. In addition, private interests can be affected, as for example related to land use and properties. Such interests will also be accommodated by the use of the legislation related to expropriation and compensation. This legislation will not be further elaborated here. Generally, the licensing processes focus on three main issues; the economic consequences for the society (locally, regionally and nationally), environmental impacts (local and national), and considerations related to the construction and other technical aspects of the projected plant (Buan et al. 2010). Another important underlying principle is, as emphasised above, the knowledge-based management of the water resources and the requirements on documentation; both as part of the license application itself, and as part of the impact assessment conducted for larger projects – based on the Planning and Building Act. The established framework for conducting assessments as part of the licensing process implies, therefore, the consideration of economic, environmental and social interests at different levels (society at large/national level vs. regional and local levels; general interests vs. more particular interests). The licensing process constitutes, hence, a comprehensive trade-off of many diverging and – sometimes –converging interests.



**Figure 5: Outline of the main procedures for licensing of hydropower in Norway.** Source: MoPE 2008a: 62.

In order to highlight all relevant and affected interests, the hearing of the license application is of great importance. In addition, the licensing authorities convene inspections and consultation meetings with affected interests, stakeholders and citizens, in order to achieve a broad and coherent overview of the case. The latter activities are explicitly required for large-scale hydropower projects, but will also be part of the assessment of license applications for smaller installations.

### 6.3.1 Large-scale hydropower

As emphasised above, the further potential for large-scale hydropower plants in Norway has been considered as limited given the political objectives agreed upon in the early 2000's. Therefore, we briefly refer to the main steps of the licensing for larger hydropower.

The formal licensing procedures for a hydropower project larger than 10 MW of installed capacity are activated once a notification from the developer is received by the NVE. First, however, the notified project has to be clarified vis-à-vis the Master plan. If the project is listed within category 1 or exempted from the Master plan the road is open for considering the granting of license. If it is listed within category 2, however,

the NVE is not allowed to proceed with the licensing procedures. After having clarified the notified project vis-à-vis the Master plan, the NVE initiates a preliminary assessment of the project in question, and is receiving inputs from the DN. In the case of disagreements between the DN and NVE, a second assessment can be undertaken by the MoPE in cooperation with the MoE. If the project passes the preliminary assessment, the Plan and Building Act and the related regulation on impact assessment apply. The licences application with the impact assessment programme and related documentation constitutes the basis for the trade-off conducted by the licensing authorities.

The trade-off must also relate to frequently substantially diverging opinions and perspectives on the project. Both economic and environmental concerns and interests can be interpreted and promoted differently by protagonists and opponents to the project. Whereas the former group often will hint at the benefits for the society at large – with increased security of supply, more climate-friendly energy production and more energy for industrial and economic development; the latter group will frequently emphasise the local and national responsibility for nature protection and biodiversity. In addition, at the local level, economic, social and environmental concerns will often be combined in different ways. Local opponents, for example, can emphasise that environmental damages also imply economic losses; as succinctly illustrated by living conditions for salmons – and the related activities with economic interests.

For large-scale hydropower projects the MoPE plays an important role in providing a final assessment and recommendation to the Government, although substantially prepared and documented by the NVE. The employment of political considerations on top of the administrative process implies that some interests and concerns will count more than others – depending on the political importance of these – and not necessarily reflecting a ‘scientifically’ informed, ‘neutral’ trade-off. It is generally assumed that the assessment at the MoPE level opens up for such political influences (Buan et al. 2010: 30). Given the complexity of the licensing system, the duration of the whole process, from the reception of the notification to the final decision on license, can be from 3 months up to several years – depending on the nature of the project (degree of interest conflicts) and the capacity of the authorities.

In recent years, the Øvre Otta case has been one of the more controversial cases of large-scale hydropower development. The watercourse is located in central parts of Southern Norway. The process of considering the hydropower potential of the watercourse was initiated in the beginning of the 1970’s with a proposal for large project of several, connected hydropower plants. These plans triggered environmental protests, and the plans were gradually scaled down. In the 1993 update of the Protection plan several side rivers to the Øvre Otta watercourse were protected. In 1996, applications for licenses having the potential of 1050 GWh production were forwarded to the NVE. In 1999, the Parliament approved to provide licenses for production summing up to a half of the amount applied for in 1996. A controversial impact of the initial application was the partial draining of some stretches of some of the side rivers to Øvre Otta. The compromise was to spare these areas and focus on the project plans with less environmental impacts. The Parliamentary decision was in 2005 expanded to a total production of 650 GWh.

The case of Øvre Otta illustrates several important features pertaining to the licensing of large-scale hydropower; the necessary clarification with the Master and Protection Plans; the possibility of considering several projects and side-rivers in connection to each other; and thereby also opening up for compromises with environmental interests and others opposing the project. Finally, the case illustrates the time- and resource demanding character of large-scale projects, where protracted processes are the rule more than the exception.

### 6.3.2 Small-scale hydropower

For small-scale hydropower (below 10 MW installed capacity), the NVE can grant licenses according to the Water Resources Act, without involving the MoPE and a political process within the Government. Licenses for the smallest projects – below 1 MW – are since 2008 delegated to the County Council, but have to be based on the NVE's assessment and recommendation. Since 2005, small-scale hydropower projects up to 1 MW of installed capacity can be permitted within protected watercourses. For small-scale hydropower there is no overall plan or reference document – comparable to the Master Plan.

There are, however, a number of county-based plans for small-scale hydropower which stipulate suitable areas for further development and installation of plants. These plans must be approved by the Ministry of the Environment, which is the superior authority in planning and land use issues. The Government in 2007 put forward guidelines to be followed by the counties when planning areas for small-scale hydropower plants, and as a basis for the NVE's consideration of licenses (MoPE 2007). The guidelines stipulate what the NVE as well as regional agencies should focus on in their treatment of applications for small-scale hydropower. Thus far, only four counties are in the process of developing small-scale hydropower plans, but none has thus far been finally approved by the MoE (the superior planning authority).

If the planned small-scale hydropower plant is not assumed to have any important environmental or other societal consequences, there is no need to grant a specific license. On the other hand, if the NVE is considering the project to have such consequences, a license according to the Water Resources Act must be granted. In this regard, the applicant may also have to submit more substantial assessments of eventual impacts.

Licenses for small-scale hydropower are generally granted without any limit in time. Hence – in principle, there is no possibility for revising the conditions or terms within the original license – as compared to larger hydropower installations licensed by the Watercourse Regulation Act. According to the Water Resources Act, there is, however, a possibility of calling for a license procedure if environmental or other consequences are affected in a negative way – not foreseen by the original assessment. This rule also applies to larger hydropower installations, as river-based plants which are not regulated by the Watercourse Regulation Act. If damages are discovered related to the environment around a hydropower plant, the NVE can also impose reversal and the introduction of specific terms in order to ensure an improved and more environmentally benign operation of the plant.

The challenges of monitoring and follow up small-scale installations in Norwegian watercourses have recently been documented (Frilund 2010). In particular, the water entrances of the installations are frequently not appropriately designed, albeit these can represent relatively large physical interventions with potentially damaging consequences for the watercourse environment. (ibid.). It has, moreover, a challenge that the municipalities rarely have the capacity to follow and monitor such installations, whereas the NVE, on the other hand, has limited resources for inspecting the increasing number of small-scale hydropower plants.

Given the fact that several of the small-scale hydropower plants are not subject to full impact assessment as required by the PBA, there is a more limited knowledge basis in such cases than for larger projects. It is, however, clear that economic and social impacts are important factors for the development and priorities of small-scale hydropower, not least as part of rural and regional development. An important, ongoing debate is also to what extent a multitude of small-scale hydropower plants are better than a handful of larger ones, if one considers the aggregate environmental impact. No comparative assessment in this regard has thus far been conducted within a Norwegian context. A preliminary study is, however, prepared as part of the GOVREP project (Bakken et al. 2011, forthcoming).

As for larger hydropower projects, small-scale hydropower owners can also be committed to pay license fees, if the plant's average annual production exceeds 40 GWh, according to the Water Resources Act. Such resources are, as mentioned, transferred directly to the hosting municipality, and represent a very important measure in order to influence the municipality's attitude towards the project.

## **6.4 Modifications and revisions of licenses for established hydropower production**

Processes opening up for modification (both limitations and expansions of production capacity), including the integration of environmental concerns, in already established hydropower production are: (1) Various processes of revisions of terms of granted licenses; and (2) the process of refurbishment or upgrading. In all of these processes the Norwegian licensing authority, the Water Resources and Energy Directorate (NVE), is mandated to coordinate the process and the related assessments of environmental, economic and social concerns. The actual inputs from different interests and actors, as well as the assessment and trade-off of the different interests and concerns conducted by the NVE, will vary from case to case depending on the character of the different projects. In cases related to the Watercourse Regulation Act the NVE recommends amendments before the MoPE which then prepares a decision that can be taken by the King in Council.

### **6.4.1 Changes and revision of terms in granted licenses**

There are six alternative ways of changing and revising the terms in already granted hydropower licenses (according to the Watercourse Regulation Act; and the Water Resources Act for small-scale hydropower plants) (NVE 2010b):

1. The legal provision of a general revision of terms, as stipulated in the Water regulations Act. This is related to certain time intervals. Such revisions must be initiated by stakeholders representing general, public interests and will be checked against specific guidelines as elaborated in more detail below.<sup>6</sup>
2. Revision of specific terms as prescribed by the specific license: In some licenses there are clauses which provide the possibility for revising specific terms, as for example the minimum release of water, or terms affecting the living conditions for salmons.
3. Reversal of permissions based on the Water Resources Act. If damages are discovered related to the environment around a hydropower plant, the NVE can impose reversal and the introduction of specific terms in order to ensure a more coherent approach to the watercourse in question. There are, however, few examples and little precedence of the use of this provision.
4. Also based on the Water Resources Act; the NVE can call for licensing process of hydropower projects which are only granted local permission according to the Planning and Building Act. This rule is only to be applied in cases where particularly important environmental consequences are identified. Based on this rule, specific mitigating and preventive terms can be set.
5. A revision clause as part of the rules of manoeuvring of the water currents: Such rules are often attached to the hydropower licenses. The majority of these rules provide the licensing authorities (NVE) with the possibility to update and amend changes when this is considered as necessary – particularly if the existing rules imply damaging consequences which were not known or sufficiently assessed at the time of licensing.
6. If the concessionaire (energy/electricity company) applies for a revision him/herself. The concessionaire who has been granted a license can apply for revision or change of certain terms, whenever she/he wishes to do so. This is only based on the licenses granted according to the Watercourse Regulation Act.

### ***Revision of terms of licenses according to the Watercourse Regulation Act***

In the following, we will specifically focus on the cases pertaining to the instances nos. 1, 2 and 5 above – which are all mandated by the Watercourse Regulation Act. This act prescribes a revision after 50 or 30 years (see footnote 5), in contrast to licenses granted according to the Water Resources Act. Nevertheless, in the latter case – as referred to in instances nos. 3 and 4 – the licenses can be re-assessed if new impacts are revealed. Approximately 340 licenses based on the Watercourse Regulation Act may be initiated for revision

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<sup>6</sup>The time for revision of licenses granted according to the Watercourse Regulation Act and the Industrial Concession Act are inscribed as a term in the individual licenses. The time frame varies from 30 to 50 years after the granting of license, depending on the date of the original license. In general, licenses granted before 1959, and between 1959 and 1972, are up for revision after 50 years. All licenses granted between 1972-92 can be revised from 2022, whereas all licenses granted after 1992 can be revised after 30 years.

until 2022 (NVE 2010b).<sup>7</sup> Up till now, only one revision has been completed (Vinstra), whereas approximately 20 are in the process. Revisions are conducted by the NVE with inputs from other sectoral authorities and stakeholders. NVE's recommendations are then put forward to the MoPE which prepares the case for the Government and the final conclusion by the King in Council.

Revisions are generally not initiated by the NVE, but should be claimed by a local stakeholder – and ideally coordinated and communicated by the municipality where the hydropower plant is located (NVE 2010b). However, the NVE itself can also initiate a revision on the background of clearly stated needs (ibid.). Revisions of terms based on the Watercourse Regulation Act are to be conducted according to guidelines recently formulated by the NVE. The guidelines were part of an extensive hearing in 2009/10. The NVE proposed revised guidelines on the basis of the hearing, which still await final approval from the Ministry of Energy and Petroleum. Hence, there is no explicit legal framework in place, although the guidelines are to be binding for the actors involved in a revision process. Some stakeholders, like the LVK, have, therefore, opted for a stronger clarification of the legal basis for revision of terms (Larsen 2010; LVK 2010). Thus far, the licensing authorities have applied a case-by-case approach to revisions. For ongoing and coming revisions, the NVE is aiming at basing the majority of revisions on the use of standard conditions. The NVE has also proposed to delimit the focus of the revisions to the issues which can be regulated by the standard conditions. The standard conditions constitute a basis for revising certain aspects of the environmental impacts of hydropower, but not those which would affect the hydropower production itself.<sup>8</sup>

A main objective with a *revision of terms* is the need for an update, particularly related to the changed focus on the environment and improved knowledge of environmental impacts. In addition, a revision can provide the opportunity to repeal conditions – both environmental and others – that are now seen as unnecessary or inappropriate. The revision also represents a possibility for formulating new conditions in accordance with public interests that have been negatively affected by the original water regulation.

Thus, only in very specific cases can economic compensations be considered as part of a revision. This includes both industrial funds and other economic compensations to the municipality or other local interests. Eventual adjustments of license fees are also exempted from the revision processes. The revision of terms implies an assessment of the conditions of the license, not the license itself. That is, a revision of terms can not result in a withdrawal or cancelling of the license itself. A related, fundamental clause is that the revision process can not amend the regulated minimum and maximum water levels. Furthermore, economic arrangements related to the license are not up for revision. Hence, the municipalities' eventual ambition of achieving more favourable compensations from the hydropower producer will normally not be accounted for.

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<sup>7</sup> 340 cases according to the Water Regulations Act, and approximately 60 cases according to the Industrial Concession Act. The revisions to be conducted on the basis of the former law are the ones which most directly affect other concerns than ownership; not least through the conditions stipulated by the license.

<sup>8</sup> At the same time, environmental measures without consequences for the production can, according to the standard conditions be applied independently – and not synchronised with, the general revisions regulated through the Water Regulations Act.

Three major concerns emerge, however, as the focal point in assessments related to revisions (NVE 2010b: 20): (1) To what extent and how new or revised terms will imply substantial improvements for the environment. This further implies an assessment of the value of the affected area, and an assessment of the stipulated measure's consequences for that value; and (2) to what extent and how new or revised terms will imply limitations in the electricity supply to the society – as considered in relation to the national security of supply, the need for more renewable energy (also as part of the climate-change policy); and (3) the related costs for the concessionaire. Hence, the revision process implies a trade-off between economy (company, local, society at large), societal development and the environment.

The critical point in most of the ongoing revision cases is the regulation of the water discharge and the minimum release, which have direct implications for the power production and the economic performance of the hydropower plant in question. Moreover, as is the case with many of the older licenses, terms were set during a time where the hydropower system was strictly national – without the current amount of international exchange and market integration. The tendencies related to a changing climate and energy policy regime, as stipulated in chapter 2 imply wider assessments than a strictly local focus and assessment of local impacts. Based on the revised guidelines, upgrading and refurbishment are issues that also are to be considered in relation to a license revision, in order to promote measures that can provide a more optimised hydropower production.

As far as the knowledge basis for revisions is concerned, the NVE states that resource-demanding research and documentation should not be required in relation to the revision cases. The LVK criticises this statement, and also calls for stronger coordination with the knowledge and documentation provided the work on regional water basin management plans, under the Water management regulation (WFD) (LVK 2010). The role of knowledge can also be considered in relation to the need for revised assessment and documentation of environmental impacts, locally – but eventually also more coherently related to the watercourse as a whole, and eventually the watercourse region/water basin.

Only one case of revision has thus far been conducted, a case related to the watercourse of Vinstra, in South-Eastern Norway. The case was finally decided by the Government in December 2008, after more than five years of assessment (MoPE 2008b). This revision has been conducted, however, without the proposed guidelines in place. Hence, there were few formal targets or criteria, and no precedence, against which one could have evaluated the conditions or revised terms to be set. The revision concerned four individual licenses within the same watercourse, which were seen in connection to each other. The revision was initiated on the request of one the concerned municipalities (Vang). The Government decided, among other things, a common regulation of the water currents for the four plants (ibid.). Only one plant has been required to establish minimal water release, whereas the concerned municipalities opted providing all four with this obligation. The LVK contends that the Government by this decision has been too strict in its consideration of water discharge requirements (LVK 2009). The Government emphasised that such requirements should be given with caution, because it implies less hydropower production (MoPE 2008b).

## 6.4.2 Refurbishment and upgrading (R/U)

As mentioned above, an important potential for further hydropower development is related to refurbishment and upgrading (R/U) of existing plants. R/U is – politically at least – perceived as environmentally sound projects since they contribute to more hydropower production with limited environmental impacts. The main objective is, however, not nature protection, but to increase the energy production. Environmental measures are, again, balanced with the potential benefits of increased production. The priority of environmental concerns is generally less pronounced in such cases, as compared to revision of terms, as referred to above. However, there is an increased emphasis of the benefits for climate-change mitigation of reinforcing the hydropower potential through R/U projects.

R//U cover a relatively broad scope of cases; from changing the mechanics within the turbine of power station, to the building of a new or additional plant, new grids, increase the plant capacity flow, or an additional or expanded water reservoir (Thaulow et al. 2007). Upgrading generally has a larger conflict potential than refurbishment, since it – in practice – often implies additional constructions with important environmental impacts – occasionally equally important as those associated with new constructions.

Given the different ramifications and impacts associated with the two categories of projects, *refurbishment* is most often limited to the licensing procedures in accordance with the Energy Act (and hence only assessed by the NVE), and eventually the Water Resources Act, whereas an *upgrading* implies a licensing procedure based on both the Energy Act and the Watercourse Regulation Act (and hence are to be decided by the Government), and/or the Water Resources Act (in the case of river-based hydropower stations). R/U cases are also encompassed by the rules pertaining to the PBA and impact assessment if the project exceeds 10 MW installed capacity or 40 GWh annual production. The IA procedures also pertain, however, if the project affects important local environmental interests.

In cases of upgrading implying substantial expansion of the hydropower production, the impacts on the local environment can be perceived as substantial by the local population or the municipality. In such cases, and when the project is considered in relation to the Watercourse Regulation Act – the question of the establishment or increase of a local industrial fund can be raised from the local level. The perceptions related to environmental damages are not necessarily proportional with the size of the project and the actual environmental impact (Thaulow et al. 2007). There is also a question of ‘activation’ of environmental interests when the project is more substantial and more visible both in the landscape, and on the political agenda.

At the same time, R/U illustrates the dilemma related to the environmental policy agenda. On the one hand, an R/U project can potentially contribute to reduction of GHG emissions if it replaces non-renewable electricity generation (in a European perspective), on the other hand such projects can increase the pressure on the local environment and biotopes – through expanded stretches with changed water regulations. The latter aspect can also conflict with environmental objectives set through the regional plans for the follow-up of the EU Water Framework Directive, which will be further elaborated below.

As for hydropower projects in general, there is, moreover, a lack of systematic knowledge and aggregation of experiences based on the different R/U cases. Thaulow et al. (2007: 11) recommend that the documentation and knowledge to the different R/U projects are collected in a database with the NVE. This measure should also alleviate the assessment and making the licensing process more effective, as well as inducing a stronger predictability for the energy industry as to the eventual outcomes of such cases. In addition, it has been documented that the current regulatory framework and economic incentives do not stimulate the R/U potential sufficiently (c.f. Thaulow et al. 2007). Not least the application of the impact assessment procedures in the Plan and Building act stands out as a cost-related barrier for project owners, because of the resource-demanding requirements for documentation related to a full IA process (ibid.).

## 6.5 Knowledge basis and documentation for hydropower

As emphasised in Section 3, knowledge and documentation is an important basis for the trade-off between different concerns and interests within the licensing process. Requirements concerning documentation have, therefore, also been formalised as compulsory parts for the licensee, both in relation to licenses for new production, as well as for modification of existing production. As indicated by the above sub-chapters, there is a main distinction between larger and smaller hydropower projects as to the requirements for impact assessments and documentation. The Planning and Building Act's (PBA) regulation on impact assessment provides the most explicit rules as to what must be documented, and how, but only for larger projects.

The PBA rules stipulate a process whereby the basis for knowledge and documentation is open for inputs from different stakeholders at two points: as part of the notification phase which precedes the formulation of the programme for impact assessment, and through the public consultation prescribed by the rules. The NVE has published guidelines for the preparation and execution of the IA programme in line with the PBA rules (updated in 2010, NVE 1998, 2010a). The updated version is more explicit on nature protection and biodiversity, reflecting the amended legislation in this area. Impact assessments must now consider eventual impacts on INON, as well as the extent to which the planned hydropower installation will affect areas of wildlife and nature (NVE 2010a). Biological diversity must also be assessed more concretely. In addition to the consequences on the aquatic environment, the applicant must also assess and document the eventual impacts, or lack thereof, on the surrounding nature and landscape (ibid.).

In addition to the possible impacts on the natural environment within and around the watercourse, the IA must also include assessments of consequences for the local economy and resources; including agriculture, forest management, tourism, fishery, outdoor recreation and other factors related to the surrounding society. Impacts related to the cultural heritage must also be substantially assessed. The IA is also to stipulate the arrangement for contact and dialogue with regional and local authorities and stakeholders. Generally, however, the guidelines for the society- and economy-related parts of the IA are less specific in comparison to the technical and environmental parts. This is clearly related to the more limited potential for standardising social data, which are often dependent on more project-specific contexts. On the other hand, however, the formal framework clearly could have been more explicit as to which social and economic factors should be covered as part of the knowledge basis for the licensing.

The assessments conducted as part of the IA process, and in relation to the preparation of the application, are to be reflected in the final application for a license. The application must, therefore, include a technical plan with stipulations of water discharge, the flow capacity through the plant, and the related water level – and variations within this. This should be based on a monitoring of the watercourse in question, with specific monitoring installations installed as part of the preparation of the application (NVE 2010a: 51). Related to this, the applicant is to propose a level for minimum water release, and the consequences of this are to figure as a crucial part of the conducted IA programme. The application must also include a proposal for rules for the regulation of the water release.

The Water Resources Act also stipulates a need for documentation, which is particularly significant in relation to smaller hydropower installations, since these are not specified in the same way as the PBA rules for larger hydropower. Hence, for small-scale hydropower plants, the formal regulation of documentation and knowledge is less detailed and explicit as compared to the criteria listed for large-scale hydropower. The guidelines for regional planning for small-scale hydropower, published by MoPE in 2007, highlight important subjects for the consideration of small-scale hydropower, but do not stipulate formal requirements as do the PBA regulation on IA (MoPE 2007).

In addition to the hydropower legislation regulating licensing, the water regulation following up the EU WFD will provide knowledge and documentation for watercourses which can constitute an important background for the assessment of licenses. As discussed above, however, the actual impact of the water regulation on the licensing processes is thus far limited. Moreover, the regional plans formulated as part of the first planning phase of the WFD in Norway mostly lacked assessments of social and economic issues, as required by the Directive.

In sum, therefore, the documentation and knowledge required by the established and new regulations, is more detailed and specific as far as environmental and technical issues are concerned, and less explicit as to social and economic factors. The latter are, however, often affected tangentially by the more environmentally and technically oriented documentation. Different stakeholders can therefore employ different arguments based on the same documentation, depending on different environmental, economic and social interests. At the same time, stakeholders also provide alternative documentation and assessments. The possibility of doing so is, however, substantially dependent on the stakeholders' resources and capabilities. Hence, there will frequently be concerns and interests which are not equally well documented within a given licensing process. Thus, a considerable challenge for the governance of hydropower in the future is the question as to who is to require, conduct and manage the follow-up of documentation related to project-specific assessments, including how conflicts of interests related to the knowledge basis should be resolved in the cases where there are diverging knowledge-based perspectives, and alternative views on feasible solutions.

## 6.6 Summary

Given the many legal acts, and the partially parallel legislation provided by the water-specific laws and the Planning and Building Act, licensing of hydropower in Norway is characterised by a high degree of complexity. This also implies relatively time-consuming processes. A general trade-off between potentially conflicting policy objectives has not been conducted for hydropower as a whole, and there is no general coordination of different objectives and concerns (economic, environmental and social), from a national, political level down to the project level. At the strategic level of overall planning for hydropower resources, the last update is represented by the latest supplement of the Protection plan, adopted by the Parliament in 2009. For the overall planning related to the Master Plan, there has been no politically sanctioned update since 1993. Hence, each case is to be considered apart, and related to its specific context, within a case-specific trade-off of relevant concerns and interests.

When assessing the status of the formal framework, it is useful to distinguish between the licensing of new hydropower and the modifications of existing plants – including revision of terms, and refurbishment and upgrading. With a less active development of larger hydropower projects in recent years, there are more ongoing licensing processes related to refurbishment and upgrading, small-scale hydropower, and the revision of existing licenses. However, for both new and revised hydropower environmental concerns are generally addressed as part of a trade-off between general and particular interests and concerns. This includes economic, environmental and social issues. The related knowledge and documentation is generally most specific in relation to environmental and technical aspects of the projects.

At the same time, there is also a relatively high degree of political interest and/or controversy related to individual cases. Politicians are often taking part in the debates concerning individual projects and specific plans for specific plants. The political involvement also often contributes to the provision of new inputs, and additional needs for assessment – which again can further delay the outcome.

All licensing processes imply public consultations and hearings, and the possibility of providing comments from relevant stakeholders. The NVE is leading and coordinating all of the above-mentioned licensing processes, but substantial parts are also involving actors at the regional and local levels. The role of the regional level is depending on the County Council's engagement in energy and/or environmental policy issues, whereas the County Governor has a specific mandate in focusing on environmental concerns. The municipalities are important actors in providing local perspectives on the project, as well as conveying and often balancing local interests and concerns.

It is reasonable to assume that the lack of an overall approach for Norwegian hydropower will be problematic given current and coming challenges, such as: (1) increased internationalisation, related to both market integration and increased climate-policy demand for hydropower, including the potential for increased pumping and storage; (2) an intensified focus on biodiversity in relation to water resources; (3) a growing number of cases seeking revision of granted licenses for existing hydropower installations; and (4) related to all of the preceding challenges, the task of achieving sufficient coordinated support from an

increased multiplicity of stakeholders becoming involved at the national, regional and local levels. All of these challenges are closely related to the issue of reinforcing and maintaining the legitimacy of hydropower in Norway, and will be further discussed in the following section.



## 7 Discussion: Main challenges for the governance of hydropower in Norway

Based on the preceding outline and assessment of the growing complexity that characterizes the licensing of hydropower resources in Norway (Sections 3-5), this section addresses the overall issue of governance of hydropower, focusing on how the current framework impacts upon both the phase-in of new, and the modification of established, hydropower production. Given a reduced potential for large-scale hydropower, alternative options for further hydropower development in Norway have become more prevalent in recent years. This involves both increased pumping and storage and the modification of existing installations through refurbishment/upgrading, and revision of granted licenses. The section focuses mainly on these three developmental paths, with a more limited reference to small-scale hydropower. The focus is in accordance with the scope of the GOVREP case studies.

As indicated in Section 3, we can first discuss the horizontal level of governance, where the coordination of different concerns and interests, from different sectors is a major issue. Given its regulatory complexity and clear significance for the Norwegian society, the hydropower sector can at first glance be associated with a specific ‘policy segment’ within the wider energy policy field (Knudsen et al. 2008). As indicated in Section 2, however, there is no overall policy objective or clear-cut priority guiding the further development of hydropower in Norway. The closest we come to a strategic framework for hydropower is the Master Plan. But, as a steering instrument, the Master Plan has not been adapted to the current energy-policy landscape, nor is there in place a more specific energy-policy framework within which hydropower plans can be integrated.

Hence, there is a no clear-cut way of linking an overall, strategic level with the more project-specific level for hydropower. The established formal framework and procedures for hydropower licenses actually also require that the trade-off between relevant concerns and interests is conducted at the project level. Whereas the regulatory framework and the relevant regulatory acts provide several check points and formal requirements, both for the applicant and the regulator, the licensing process is also clearly characterised by the case-specific trade-off between specific affected concerns and interests. Based on existing practice, therefore, there is no clear-cut answer as to what constitutes an ‘ideal’ project according to overall criteria. Accordingly, the specific interests surrounding the individual hydropower projects, not least the relation between different economic, social and environmental interests, make it difficult to predict the outcome in the individual cases, even when these appear to be related to precedence and experience with similar cases. The case-to-case-approach, as it has evolved over several decades, is a characteristic feature of the governance system for hydropower in Norway, and is codified into the legal framework for licensing. Further, the licensing authorities must also include the overall objectives and concerns stipulated in the legislation, and by national policy strategies and processes, when conducting the trade-offs related to the individual hydropower projects.

The case-to-case approach thus poses serious challenges with respect to the applied coordination of overall policy objectives, at the same time as the established, regulatory framework for licensing appears to be

difficult to alter. A major institutional challenge here is the coordination of the diversely responsible energy and environmental ministries and agencies. The follow-up of the WFD in Norway is a clear illustration of these challenges. The follow-up has demonstrated that the established mandates and roles of the relevant authorities – the allotted policy ‘segments’ of the MoPE, the MoE, and other affected domains – remain highly ‘path-dependent’, with little tendency towards innovative adaptation and change. The relevant hydropower follow-up to the WFD has consisted in delegating the responsibility for the formulation of mitigating measures to the energy authorities. Together with the Government’s decision to treat environmental concerns within the scope of individual hydropower projects in the license processes – requiring to only be ‘informed’ of the regional water management plans – the situation reinforces an impression of a governmental follow-up steeped in established institutional patterns, rules and procedures.

The structure of the public agencies and their mandates also clearly impacts on the licensing processes and the chosen policy objectives that are to prevail, given that there are few overall guidelines as to what priorities should be made. A ‘project-specific’ approach to hydropower development thus seems to be an ‘embedded’ and change-resistant part of the established governance of the sector in Norway. The situation poses increasing challenges for effective change, given the substantial, cross-cutting energy policy issues on the current and future agenda, which is also increasingly related to an international dimension. One such cross-cutting challenge is that some environmental concerns relate to specific economic interests more than others, thus becoming more invested environmental *interests*. This is increasingly the case with climate-change in a wider, international perspective, including an increased demand for hydropower production for a European market, which has already manifested itself through greatly increased incomes for power producers. Another example is the case of salmon fishing in watercourses with established interests related to recreation and tourism (see Egeland and Jacobsen 2011, forthcoming). There thus emerges less interest for financing and stimulating documentation for *other* fish species needing protection.

Such cross-cutting issues also constitute a challenge at the local level, where the municipality conducts a trade-off between different concerns and interests when defining their position vis-à-vis hydropower projects. This trade-off process will sometimes also be influenced by the municipality’s shareholder interests in the electricity company owning the hydropower project. A similar dilemma, but less openly addressed, is also present at the national level given the fact that the State is legally accorded several roles at the same time: as owner of production capacity; owner of the central grid; and also owner of a large portion of the regional grid. At the same time the State is the license authority. For larger hydropower projects (of which there are fewer and fewer), a final political process within the Parliament can open for a broader debate as to such different interests. Decisions at the political level, however, often imply less predictability and greater inconsistency in the licensing process. It is not uncommon that essential aspects of the trade-offs conducted as part of the NVE’s licensing process are added by new concerns raised in the political debate at the final stage.

When turning to the vertical dimension of governance (as outlined in Sections 2 and 5 above), the international level increasingly impacts upon Norwegian hydropower governance from both the

environmental and energy side. Currently, however, the environmental aspect influences Norwegian hydropower more indirectly than directly. First, environmental policy targets for biodiversity and salmon are set as follow-up measures of international commitments. Secondly, also indirectly but in a more limited way, the follow-up of the EU WFD and the regional river basin management plans are intended to interact and provide inputs to the assessment of hydropower licenses, and revisions thereof. Thirdly, as far as climate-change mitigation is concerned, the European emission-trading system influences the prices and market prospects for Norwegian hydropower, both nationally and within a European context. A more direct influence, which is not yet fully documented, is a growing demand for Norwegian hydropower as a ‘balancing factor’ for wind and solar power production in Europe. Currently, this is mostly a possibility discussed by parts of the energy industry and some politicians (Norway as Europe’s ‘green battery’), and not a concrete policy strategy with clear policy objectives. This is a potential which can be reconciled with climate-policy concerns, industrial ambitions and concerns for security of supply both in Norway and in Europe. At least some of the projects for increased pumping and more frequent fluctuations in water level will, however, conflict with the reinforced focus on more sustainable water management, and a stronger safeguarding of the biotopes and landscapes affected by hydropower. Also here, however, there is still limited documentation, vis-à-vis both local effects and with respect to related impacts on the energy system and market at the national and European level.

Currently, however, the most direct and concrete linkage between the international level and Norwegian hydropower is the integration within a Nordic market, with its ramifications for the wider European market under development. The further prospect of pumping and storage in Norway will also very much depend on the ‘supply-side’ in this market; that is, the energy producers’ perception of the profitability and viability of this option. The ‘demand-side’ is the combination of political actors, energy regulators and energy companies in countries such as Germany who want to have a ‘back-up’ for increased shares of variable wind and solar energy. With more environmental requirements stemming from the international level and with a more diversified international environmental policy agenda, the environmental concerns, related policy objectives, and stakeholders can also gain more legitimacy and (indirectly at least) more leverage in assessments and licensing for hydropower. At the same time, one risks a growing potential for conflicts of interests between the different environmental policy targets (mainly climate vs. biodiversity) if no new, overall trade-offs and priorities are taken at the national level.

When assessing the importance of the international level vis-à-vis Norwegian governance for hydropower, it is also important to bear in mind that this interaction does not necessarily follow a strictly hierarchical pattern. An example of a less hierarchically bound linkage could be the emerging connection between the EU and the regional level in the follow-up of the WFD. Although the regional plans are formulated within a national context, and are to be approved by the national government, the regional level can increasingly be informed by developments at the European level. In addition, in the further development and eventual standardisation of knowledge and requirements for documentation within an EU context, regional actors involved in the further follow-up of water management plans can be more directly exposed to EU-based assessments of hydropower. A recent interesting development is that the National Association of

Hydropower Municipalities (LVK) – together with other NGO’s representing environmental and recreational interests – have complained to the EFTA Surveillance Authority (ESA)<sup>9</sup> about the Norwegian follow-up of the EU WFD in the pilot phase (LVK et al. 2011). They claim that the Government’s decision to set environmental standards for hydropower through the licensing process, rather than as environmental objectives within regional river-basin management plans, thereby requiring the licensing authorities to follow up in individual cases, runs counter to the main rules of the directive (ibid.). If the ESA finds that the LVK and others have a good case, they can conclude that Norwegian authorities must alter this approach and upgrade the status of the WFD-related environmental objectives.

One also risks, therefore, an increasing conflict of interests across levels of governance. Actors at both the national and the local levels are quite critical towards the prospects of a stronger integration of Norwegian hydropower within a European energy system. Some fear that this will expose municipalities to more disadvantages related to larger fluctuations in water levels (LVK 2009). At the same time the municipalities fear that they will not be adequately compensated as long as the additional incomes from higher export levels are not accounted for in the license fees, industrial funds and the other traditional income sources for the municipalities (ibid.). At the same time, however, many municipalities receive incomes from increased production by having shares in hydropower production companies.

The refurbishment and upgrading (R/U) of existing hydro installations also illustrates the dynamic between the national and local levels. Although most R/U cases are quite limited in scope (as compared to large-scale projects), R/U can nevertheless be controversial at the local level. This is particularly so if such projects imply changes in the water regulations, which can in turn impact the watercourse or the surrounding landscape. Although these changes are often quite minor, and potentially compatible with environmental concerns, there can be other social and economic concerns affected which contribute to opposition towards the project, and also to a higher level of conflict. The refurbishment and upgrading of existing hydropower is frequently profiled as a climate policy measure, one that contributes to the replacement of fossil energy production with climate-friendly hydropower. R/U can also be seen as contributing to security of energy supply, thereby fulfilling energy policy objectives beyond climate-change reduction. As for the trade-off challenge, R/U can be seen as part of a reinforced priority of modifying existing hydropower production – given the limited potential for further development of large-scale hydropower in Norway. Politically and strategically, this is also emphasised through the NVE’s draft guidelines for the revision of existing licenses where R/U is a potential issue (NVE 2010b). Thus far, however, there are few examples of how this can be conducted in practice. This also touches on the potential for win-win solutions, where different hydropower projects are considered in interactive relation to each other, often within a regional context (c.f. Thaulow et al. 2008). This again, also requires a more integrated strategic approach to further hydropower development, within and across national, regional and local levels.

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<sup>9</sup> ESA is the institution which oversees and controls the follow-up of the EEA agreement, on the EFTA side. The EU Commission has a similar role for the EU side.

As emphasised above, the procedures for impact assessments (IA) is currently the most forceful tool for increasing the knowledge base for hydropower decision-making. The potential for applying the tool is, however, hindered by the increasing number of projects, including revision, where the standardised IA framework does not apply. This opens up for more various ad-hoc project-dependent approaches. In addition, stakeholders and actors affected by hydropower often provide supplementary research and documentation as a way of promoting specific positions and interests. Knowledge contributions here, however, are strongly dependent on the resources of the various parties activated by a project. With a less standardised framework for knowledge and documentation, there is clearly a risk of biased side-effects, and increased communicative ‘noise’, related to such resource differences.

Another important challenge, for all cases of hydropower, is the lack of tools for aggregating the documentation and knowledge, including past experiences. An additional challenge is when there are alternative documentation processes providing divergent data and results as to the impacts and consequences of a given project. Here, the licensing authorities must try to deal with competing perspectives and eventually rely on their own established perspective. As there is no aggregate set of overarching standards to be focused and prioritised in the different categories of cases, it is also hard to tell what significance various forms of knowledge and documentation are of key relevance for different cases. It is generally not known what arguments and types of documentation are the most prevalent. In addition, there are specific areas for which there is a deficit of general knowledge as well as a scarcity of assessments and documentation of impacts. This is particularly the case with respect to the aggregated impact of small-scale hydropower, and the effects of a more extensive employment of the pumping and reservoir capacities within the Norwegian hydropower system.

As a way of dealing with these new challenges to the knowledge base, steps could be taken to establish a data bank aiming at some kind of standardisation of insights and data gained from the assessment of the various projects (c.f. Thaulow et al. 2007). Such an informational resource could also contribute to a higher degree of transparency and legitimacy of the licensing processes. It is important to point out, however, that increasing the status and quality of case-based knowledge will not automatically influence either the outputs of the licensing processes, or the difficult issue of resolving trade-offs between environmental, economic and social concerns. Given the predominantly case-by-case approach to hydropower development, a more coherent knowledge basis will not necessarily change the priority between different interests and concerns in a general manner. As long as the volume of discharge water and the water level itself has to be considered within the specific context of each case, it is difficult to say whether a more standardised knowledge basis could be employed, and eventually systematically impact on the outcome of the trade-offs. At the same time, the possibility of drawing on knowledge and experiences from comparable cases, and reviewing the underlying knowledge and documentation by third parties, could constitute an important step towards a strengthening of the overall legitimacy of the licensing system.

## 8 Conclusion and further perspectives

This report has provided an extensive mapping of the formal framework, including the most relevant regulations related to the phase-in of new hydropower production, as well as modification of existing hydropower installations. Secondly, the report provides an overview of the principal actors and arenas influencing the licensing of hydropower in Norway. The principal analytic approach of the report is to describe and assess these two aspects of hydropower development as an emerging dynamic within and between the horizontal (inter-governmental) and vertical (multi-level) dimensions of hydropower governance.

In sum, the assessment demonstrates that the current state of ‘steering’ hydropower development in Norway is both complex and fragmentary. There is no overall target providing a general direction for hydropower development. The role of hydropower within the wider energy-policy sector and the energy system itself has not been substantially reviewed and updated in a policy and governance context during the last decade.

At the same time there are clear political and economic driving-forces which aim at a further expansion of hydropower in Norway. These drivers can be associated with cross-cutting interests and arguments pertaining to climate policy, security of energy supply, industrial development; and regional economic and social policies. A principal question that has emerged from the analysis is whether the current ‘regime’ for hydropower governance, with its main objectives, concerns and interests as promoted and conveyed by principal actors, will be able to adapt to changing circumstances.

The analysis indicates that an increasingly important factor affecting this issue is the role of both EU energy and water policy. The full effect of the EU’s energy policy on Norwegian hydropower development is, however, still pending, due to the uncertainty of Norway’s target for the follow-up of the EU RES Directive. Given former experiences with national implementation of international commitments, it is possible that the RES Directive will not substantially alter the institutional mandates or procedures pertaining to hydropower licensing. The formal framework for licensing seems to be highly ‘path dependent’. The institutions and procedures in question demonstrate, in other words, considerable structural and historical inertia. International commitments are increasingly ‘grafted onto’ existing practices, with little attempt to adapt and integrate the new goals and targets through revised mandates and procedures. This is particularly evident in relation to the follow-up of the EU Water Framework Directive. In a similar manner, the incentives provided by the RES Directive and the establishment of a Swedish-Norwegian certificate system, will also affect the number and nature of hydropower licensing processes, with increasing pressure to make the procedures less time-consuming – without reducing their overall legitimacy. Assuming that the certificate system will be established as foreseen, there is thus reason to believe that changes will occur in relation to the management of the licensing of hydropower.

Any such changes will, however, still build on the case-to-case approach to hydropower in Norway. Given the lack of an overall, coherent approach, the interaction between the different levels of governance is

generally fragmented and inconsistent. At the same time, the national level clearly stands out as the decisive arena given the role of the national licensing authorities. The nature of the interaction between the national level and the regional/local levels largely depends on the character of the specific cases and projects in question. This also applies to differing degrees of interest divergence and politicization; which again further increases the overall complexity of the case, and hence the consumption of time and resources.

Given these overall trends and challenges, the nature and quality of the knowledge base and documentation emerges as crucial in two distinct ways: (1) By focusing a need to reinforce the accessibility and transparency of the knowledge base in relation to the various hydropower projects. This can lead to a more cumulative and integrated knowledge base for hydropower governance, promoting a more consensual understanding of cases and projects within new and better categories of explanation and prediction. (2) By stimulating and improving complementary research and documentation efforts that focus on the specific challenges raised by a renewed interest and demand for hydropower, within a broadly expanded landscape of both technical approaches and multifaceted economic, social and environmental concerns.

The first aspect can be partly accommodated by the establishment of a data bank assembling research, documentation and experiences related to individual projects. The second aspect implies improved understanding of the variegated interests and concerns that are emerging, and the interaction between actors at different levels of political responsibility, as well as across different categories of projects. The latter in particular is a major goal of the GOVREP research project, which has already initiated thematically focused case studies of ongoing hydropower licensing processes (Egeland and Jacobsen 2011; Egeland forthcoming). Similar case studies, within a controlled comparative design, are necessary to strengthen the validity of the knowledge base. A further goal should be to catalogue and assess the growing battery of energy-policy planning tools and policy instruments. Finally, the Norwegian efforts in these areas should be assessed in relation to similar initiatives in other European countries where the demands for green hydropower inevitably conflict with the demands of biodiversity, pristine nature and numerous other regional and local socioeconomic interests.

The GOVREP project has already initiated comparable studies with Sweden (Rudberg 2011); and Austria also stands out as a focus case for comparing the impact of the new EU energy and water directives on the concerns and interests associated with a ‘traditional’ regime for hydropower governance (Pflügmayer et al. 2008).



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