

# A Swedish National Re-Examination of Water Operations

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**Key words:** Water operations, EU Water Directive, Renewable electricity, Hydro power permits, Land and Environment court, Sweden.

## SUMMARY

Sweden will implement the EU Water Directive (2000/60/EC) and, according to a cross-party agreement reached in 2016, Sweden also aims to achieve 100 percent renewable electricity production by 2040.

To clarify the implementation of the directive and to implement the hydro power related parts of the energy agreement, new legislation was introduced as of January 1, 2019, implying among other things that every actor who carries out water operations (“vattenverksamheter”) to produce hydroelectric power must provide the operations with permits containing modern environmental conditions.

This will be done by re-examining the operations in the Land and Environmental Courts at the initiative of the operator. There are approximately 2 000 hydro power plants in Sweden today, of which just over 200 with an output of over 10 megawatts. The number of operations in need for re-examination, which is not limited to power plants, has been estimated to at least 7 400. To ensure a coordinated effort, with the greatest possible environmental benefits while ensuring national efficient access to hydroelectric power, a proposal for a national plan for re-examinations covering some 2 400 operations has been compiled by relevant authorities and submitted to the government for approval as of October 1, 2019.

The re-examinations will put pressure on the Land and Environmental Courts and other actors involved. It will also involve delicate considerations between the need for reconsideration for the benefit of the environment and the issue of a secure and stable electricity supply. The latter issue has received increased domestic attention during 2019 as a result of, among other things, strong growth in urban areas and a lack of capacity in the transmission of electricity between different parts of the country.

The objective of this paper is to present an overview of the current proceedings for the national re-examination of Swedish water operations.

# A Swedish National Re-Examination of Water Operations

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## 1. INTRODUCTION

Sweden will implement the EU Water Directive (2000/60/EC) and, according to a cross-party agreement reached in 2016, Sweden also aims to achieve 100 percent renewable electricity production by 2040.

New legislation was introduced as of January 1, 2019, though the government bill Water Environment and Hydro Power.<sup>1</sup> The legislation has three main objectives:<sup>2</sup>

- To clarify the implementation of the EU Water Directive.<sup>3</sup>
- To implement the hydro power related parts of the energy agreement.<sup>4</sup>
- To implement changes that are necessary in response to the Parliaments announcement on the conditions for small-scale hydroelectric power activities.<sup>5</sup>

A result of the new legislation is, among other things, that every actor who carries out water operations (“*vattenverksamheter*”) to produce hydroelectric power must provide their operations with modern environmental conditions.<sup>6</sup> This will be done by re-examining the operations in the Land and Environment Court at the initiative of the operator.

To ensure a coordinated effort, with the greatest possible environmental benefits while ensuring national efficient access to hydroelectric power, the Environmental Code stipulates that there should be a national plan for re-examination, approved by the government.<sup>7</sup>

A proposal for a national plan for re-examinations covering some 2 400 operations has been compiled by relevant authorities and submitted to the government for approval as of October 1, 2019.<sup>8</sup>

The objective of this paper is to present an overview of the current proceedings for the national re-examination of Swedish water operations.

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<sup>1</sup> prop. 2017/18:243 “*Water Environment and Hydro Power*”

<sup>2</sup> Havs och Vattenmyndigheten m.fl. (2019), p. 1

<sup>3</sup> Civil Committee of the Swedish Government (2017)

<sup>4</sup> The Swedish Government (2016)

<sup>5</sup> Civil Committee of the Swedish Government (2017)

<sup>6</sup> SFS 1998:808, chapter 11 section 27

<sup>7</sup> SFS 1998:808, chapter 11 section 28

<sup>8</sup> Havs och Vattenmyndigheten m.fl. (2019)

## 2. BACKGROUND

Sweden is a country with approximately 192 000 kilometers of watercourse ("vattendrag"), not counting minor streams, and has been able to use this resource for energy production since the middle ages. There are approximately 1 800 hydro power plants in Sweden and 10 000 dams, affecting the aquatic environment.<sup>9</sup>

### 2.1 Hydro Power in Sweden

Hydro power has a key role in the Swedish electricity system and produces 67 tWh during a normal year, which is approximately 45 percent of the Swedish power production.<sup>10</sup>

Hydro power also has a high regulatory ability, which means as a power source it has a unique capacity for adjustment of production levels in accordance to current demand and to current production levels of other sources of power, i.e. wind and nuclear power.

### 2.2 The importance of flowing water and wetlands

Natural flowing water and wetlands are some of Sweden's richest habitats. The biodiversity of lakes and rivers has for a long time been negatively affected in several ways. Up to a quarter of Sweden's original wetland area has disappeared through drainage, lake subsidence and straightened ditches. Freshwater environments and wetlands have been reduced in size, fragmented and isolated as a result of, among other things, construction of dams and power plants and utilization of areas for agriculture and forestry. Even a single obstacle in a catchment basin can change the structure and function of the eco-system, with the risk that certain species will be adversely affected and even eradicated.<sup>11</sup>

Dams are the most obvious physical obstacle as a result of hydro power plant construction and severely affects the possibilities for fish and other organisms to swim upstream and downstream, as well as the natural conditions for transport of sediment and organical material. The alteration of the physical environment also affects erosion, water temperature, ice conditions and water quality.<sup>12</sup>

Even bigger impact on the watercourse and its habitats can occur due to dramatic changes in water flow. For example, when water is kept for power production during cold winters, water flows will diminish during spring and summer, affecting the whole ecosystem of the watercourse.<sup>13</sup>

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<sup>9</sup> Havs och Vattenmyndigheten m.fl. (2019), p.24

<sup>10</sup> prop. 2017/18:243 "*Water Environment and Hydro Power*" p. 62f.

<sup>11</sup> prop. 2017/18:243 "*Water Environment and Hydro Power*" p. 61

<sup>12</sup> Havs och Vattenmyndigheten m.fl. (2019), p.25

<sup>13</sup> Havs och Vattenmyndigheten m.fl. (2019), p. 24f

## 2.3 The Environmental Code

Swedish environmental legislation developed rapidly during the second half of the 20<sup>th</sup> century and was consolidated in the Environmental Code (“*Miljöbalken*”)<sup>14</sup> as of January 1, 1999. According to chapter 1 section 1, the Environmental Code aims to promote sustainable development, which means that current and future generations are ensured a healthy and good environment. Such a development is based on the insight that nature has an inherent value to protect and that humans right to change and use nature is associated with a responsibility to manage nature well.

Regulations on water operations can be found in chapter 11 of the Environmental Code and in the Supplementary Act on Special Regulations for Water Operations (SFS 1998:812). Water operations to produce hydroelectric power include water regulation (“*vattenreglering*”), water dissipation (“*vattenbortledning*”), water conduction (“*vattenöverledning*”) and other operations affecting the flow of water that is either intended to produce electricity through the conversion of energy in flowing water, or was intended for such production when the operation begun.<sup>15</sup>

Water operations in most cases require permits in accordance with chapter 11 of the Environmental Code.<sup>16</sup> Such permits can be applied for in the Land and Environmental Court.<sup>17</sup> There are five Land and Environmental Courts in Sweden and one Land and Environmental High Court. The Land and Environmental Courts are located in the towns of Växjö, Vänersborg, Nacka, Östersund and Umeå.<sup>18</sup> The Land and Environmental High Court is located in Svea High Court, Stockholm.<sup>19</sup>

Permits for water operations in accordance with the Environmental Code, granted by the Land and Environmental Court must be provided with conditions that are necessary regarding, among other things, environmental concerns.<sup>20</sup>

For obvious reasons, most of Swedish hydroelectric power plants have been in operation since before the Environmental Code came into force. A re-examination of permits can be conducted for example because of a desire to modify an operation.<sup>21</sup>

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<sup>14</sup> SFS 1998:808

<sup>15</sup> SFS 1998:808, chapter 11 section 6.

<sup>16</sup> SFS 1998:808, chapter 11 section 9.

<sup>17</sup> SFS 1998:808, chapter 11 section 9 b.

<sup>18</sup> SFS 2010:984, section 1

<sup>19</sup> SFS 2010:921, chapter 1 section 1,

<sup>20</sup> SFS 1998:808, chapter 22 section 25.

<sup>21</sup> See for example SFS 1998:808, chapter 22 section 1 d.

## 2.4 The implementation of the EU Water Directive (2000/60/EC) in Sweden

The Water Directive obliges EU member states to adopt environmental goals (introduced in Sweden in the form of environmental quality norms, “*miljö kvalitetsnormer*”), action programs and management plans for each country’s water by December 2009. In accordance with the Directive, the water of Sweden is to be improved and a long-term sustainable management of water resources is to be achieved. The waters affected must have reached good ecological status by the year 2015 or by time exemptions in the years 2021 or 2027. Sweden has implemented the Water Directive through, among other things, chapter 5 of the Environmental Code.

There are many waters in Sweden that has been subject to extensive physical changes due to various activities with great societal value. In these cases, it is not reasonable to achieve good ecological status, as negative impact on these operations could have severe consequences for society. Hydro power electricity production is one such operation that can be considered of critical societal value. If specific conditions are met for such a water, it can be declared to be a heavily modified water, which means that the specific environmental goal for that water is no longer good ecological status but good ecological potential.<sup>22</sup>

Since 2007, the European Commission has been conducting an infringement case against Sweden on the implementation of the Water Directive, as the Commission considers previous legislative measures insufficient. To clarify the implementation of the EU Water Directive, the Swedish Parliament introduced new legislation as of January 1, 2019, stipulating among other things that every actor who carries out water operations (“*vattenverksamheter*”) to produce hydroelectric power must provide their operations with modern environmental conditions.<sup>23</sup>

## 3 THE NEW LEGISLATION

The new regulations can be found mainly in chapter 11 of the Environmental Code.

### 3.1 The modern environmental conditions requirement

According to chapter 11 section 27 of the Environmental Code, every actor who carries out water operations (“*vattenverksamheter*”) to produce hydroelectric power must provide their operations with *modern* environmental conditions. By this is meant that the conditions of the permit for the protection of human health and the environment have been determined according to the Environmental Code by a judgment or in a decision not older than forty years.

There shall be a national plan for the re-examinations referred to in chapter 11 section 27. The plan shall specify a national comprehensive view ensuring that operations will be provided

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<sup>22</sup> Havs och Vattenmyndigheten m.fl. (2019), p. 31.

<sup>23</sup> prop. 2017/18:243 “*Water Environment and Hydro Power*”

with modern environmental conditions in a coordinated manner with the greatest possible benefit for the aquatic environment while ensuring a national efficient access to hydroelectric power. The plan must be decided by the government.<sup>24</sup>

An on-going operation without modern environmental conditions can operate only if the operator has either already applied for re-examination or is included in the national plan for re-examinations (“the national plan”).

### 3.2 The national plan for re-examinations of hydro power operations

More detailed requirements on the national plan can be found in the Decree of Water Operations<sup>25</sup>, section 24 – 44.

The national plan shall be compiled by the Swedish Agency for Marine and Water Management (“*Havs- och vattenmyndigheten*”), the State Energy Authority (“*Energimyndigheten*”), and the Swedish Grid Authority (“*Svenska kraftnät*”) and it should provide guidance for authorities participating in re-examination cases and/or making decisions concerning water quality management.<sup>26</sup>

The national plan shall promote firstly that the on-going work on classification and quality requirements – in accordance with the Water Management Decree<sup>27</sup> – is carried out with the prioritization scheme needed to implement the plan. Secondly, the plan shall promote that when examining individual water operations, the possibility of acting within the framework of other water operations in the same body of water, watercourse or river basin or in another river or river basin should be considered.<sup>28</sup>

To promote such coordinated priorities and considerations, the national plan must state *re-examination groups* for operations that may affect one and the same water body (“*vattenförekomst*”), watercourse (“*vattendrag*”) or catchment basin (“*avrinningsområde*”) in such a way that the operations should be re-examined in a context. The plan must also state when the application for re-examination concerning water operations in each re-examination group should be submitted to the Land and Environment Court at the latest. The re-examination groups shall be designated as geographically defined areas.<sup>29</sup>

In terms of the impact on efficient access to hydroelectric power, the plan shall promote (1) the greatest possible regulatory ability in the national electricity production, (2) that the need for increased power production can primarily be met in existing hydro power plants, (3) electricity preparedness and national, regional and local stability of the electrical grid; and (4) that as much consideration as possible regarding cultural environment, industry,

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<sup>24</sup> MB chapter 11 section 28

<sup>25</sup> SFS 1998:1388

<sup>26</sup> SFS 1998:1388, section 24 – 25.

<sup>27</sup> SFS 2004:660

<sup>28</sup> SFS 1998:1388, section 26.

<sup>29</sup> SFS 1998:1388, section 28

infrastructure, housing, agriculture and other social interests can be taken into account when re-examining individual water operations.<sup>30</sup>

#### 4 THE PROPOSAL FOR A NATIONAL PLAN

A proposal for a national plan (“the plan”) has been compiled by the responsible authorities and submitted to the government for approval as of October 1, 2019.<sup>31</sup> The plan aims to lay the foundation for a systematic approach to achieve the goal of maximizing the greatest possible environmental benefit while ensuring a national efficient access to hydroelectric power. The main focus when it comes to aquatic environment benefit is to achieve the best result in terms of the quality of the aquatic environment as well as to reach the Natura 2000 and species protection regulations.

According to the plan, the national comprehensive view necessary for a systematic approach includes:<sup>32</sup>

- Re-examination groups and schedules to enable effective re-examination processes.
- A guideline at national level (1.5 terawatt hours) and that guideline value distributed per main catchment basin, as guidance for what can be considered to be a significant negative impact on power production when declaring that a water body is heavily modified and deciding on exemptions.
- A comprehensive description of where in the country there is a risk of conflict between conservation goals in Natura 2000 areas and water regulation in favor of efficient access to hydro power.
- A description of where the most important power plants are from the regulatory point of view (class 1 hydro power plants).
- A description of the catchment basins where special attention needs to be paid to electricity preparedness and dam safety.
- Reasoning on the conditions for increasing power and regulatory capacity.
- How cultural environmental issues should be taken into account in general.

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<sup>30</sup> SFS 1998:1388, section 27.

<sup>31</sup> Havs och Vattenmyndigheten m.fl. (2019)

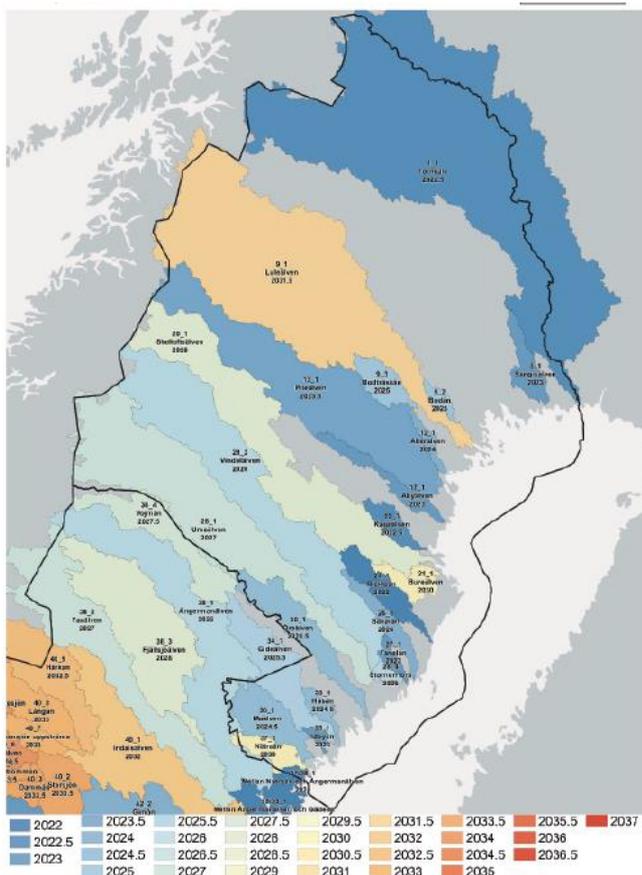
<sup>32</sup> Havs och Vattenmyndigheten m.fl. (2019), p.8.

## 4.1 The re-examination groups

As prescribed in section 28 of the Decree of Water Operations, the plan states re-examination groups for operations that may affect one and the same water body, watercourse or river basin in such a way that the operations should be re-examined in a context.

There are just over 100 re-examination groups listed in the plan, and it is suggested that the applications for re-examination are submitted to the Land and Environment Courts according to a schedule during a period of 16 years, starting in 2022.

The re-examination groups are designated as geographically demarcated areas, see picture 4.1.a.



Picture 4.1.a. One of five maps of re-examination groups in the proposal for a national plan for re-examination of Swedish water operations.<sup>33</sup> The color of each group indicates when an application for re-examination concerning a water operation within the group should be submitted to the Land and Environmental court.

The re-examination groups have been designed with consideration of approximately 2 400 water operations (hydro power plants and dams).<sup>34</sup>

## 5 THE ROAD AHEAD

The current plan for re-examination cover approximately 1 800 hydro power plants and 600 dams. The re-examinations are to be accomplished during a period of 20 years, with the first applications submitted in 2022.<sup>35</sup>

Conducting the re-examinations in accordance with the national plan will require a systematic follow-up and adjustments of the plan will likely be necessary over time to reach the goal of a coordinated effort, with the greatest possible environmental benefits while ensuring national efficient access to hydroelectric power.<sup>36</sup>

The re-examinations will put pressure on the Land and Environmental Courts and other actors involved. It will also involve delicate considerations between the need for reconsideration for the benefit of the environment and the issue of a secure and stable electricity supply. The issue of a secure and stable electricity supply has received increased domestic attention during 2019 as a result of, among other things, strong growth in urban areas and a lack of capacity in the transmission of electricity between different parts of the country.

The issue of national supply of electricity will undoubtedly effect national policy on the production of electricity. Two political parties (out of five) announced in December 2019 that they will leave the cross-party energy agreement reached in 2016 to achieve 100 percent renewable electricity production by 2040<sup>37</sup>, although in the short term this should have no effect on the up-coming re-examinations of water operations.

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<sup>33</sup> Havs och Vattenmyndigheten m.fl. (2019), appendix 1c, p. 13.

<sup>34</sup> Havs och Vattenmyndigheten m.fl. (2019), p. 8

<sup>35</sup> Kling, J. (2019).

<sup>36</sup> Havs och Vattenmyndigheten m.fl. (2019), preface p. IV

<sup>37</sup> SVT Nyheter (December 10th 2019).

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*Vattenmiljö och Vattenkraft ("Water Environment and Hydro Power")*, prop 2017/18:243 (government bill).

## Legal

SFS 1998:808, *Miljöbalken* ("the Environmental Code").

SFS 1988:1388, *Förordning om vattenverksamheter* ("Decree of Water Operations").

SFS 2010:921, *Lag om mark- och miljödomstolar* ("Land and Environment Court Law").

SFS 2010:984, *Förordning om mark- och miljödomstolarnas domsområden* ("Decree of Areas of Jurisdiction of the Land and Environmental Courts").

## BIOGRAPHICAL NOTES

Daniel Janonius Löwgren is a technical judge in the Land and Environment Court in Umeå, Sweden. He graduated with a master degree in land administration from The Royal Institute of Technology (KTH) in Stockholm, Sweden, in 2010.

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