Dissertation Exposé/Long Paper

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Tracing Evidence: How Frames Influence Legal Decisions

Illustrated by environmental impact assessments of hydroelectric powerplants

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1. Outline of the state of research

1.1. Environmental Impact Assessments

1.1.1. Scope and Goals

The EU's Environmental Impact Assessment (EIA) Directive requires major building or development projects to first be assessed for their impact on the environment. Thereby, the EU wants to ensure the proper integration of environmental concerns into the decision-making process[1] and to establish environmental protection and transparency by optimising the project's environmental indicators.[2] One key feature of EIAs is the broad public participation, ensuring that those affected can participate in the decision-making process,[3] and thereby strengthening the acceptance of planned projects.[4]

1.1.2. Subjected Projects

In Austria, the EIA Directive is implemented by the Federal Act on Environmental Impact Assessment (UVP-G).[5] Projects subjected to an EIA are e.g. waste management facilities, power stations, infrastructure projects, agricultural projects, urban or industrial development projects, waste disposal installations and other projects, that are expected to have a substantial adverse impact on the environment.[6] Apart from the project type, its size, emissions and location are relevant in determining whether a project must undergo an EIA.[7]

1.1.3. Involved Parties

Next to the parties stipulated by the applicable administrative provisions,[8] the UVP-G provides *locus standi* to neighbours, the ombudsman for the environment, the water management planning body, concerned municipalities, citizens' groups, environmental organisations, and, most recently,[9] the ombudsman for the economic location.[10] Assessing authority is the respective Provincial Government, although this might deviate under specific circumstances, e.g. if federal roads or high-speed railroads are assessed.[11]

1.1.4. Procedure

A specific of EIAs is the "consolidated development consent procedure", meaning that all required provisions under federal or provincial administrative law are consolidated at once.[12] Thereby, all sectoral and community legislation (e.g., forestry, water, landscape protection etc.) is assessed within one single procedure by one single authority.[13]

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[1] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance.

[2] *European Commission*, 35 Years of EU Environmental Impact Assessment, 2021, P 3.

[3] *European Commission*, Environmental Impact Assessments, https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment_en#objectives, last accessed 29.06.2023.

[4] Rec 16, Directive 2011/92/EU; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 9 UVP-G 2000 RZ 1.

[5] Bundesgesetz über die Prüfung der Umweltverträglichkeit (Umweltverträglichkeitsprüfungsgesetz 2000 – UVP-G 2000), BGBl. Nr. 697/1993 idF BGBl. I Nr. 26/2023 (UVP-G).

[6] Exemplary Annex I UVP-G.

[7] § 3 UVP-G; Annex I UVP-G; *Ennöckl* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 3 UVP-G 2000 RZ 1.

[8] *Altenburger*, Kommentar zum Umweltrecht[2] (2020) § 19 UVP-G RZ 2.

[9] The ombudsman for the economic location was introduced through amendment BGBl. I Nr. 80/2018.

[10] § 19 Abs 1 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 19 UVP-G 2000 RZ 11.

[11] § 39 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 39 RZ 1.

[12] § 3 Abs 1 UVP-G; *Berger* in Altenburger (Hrsg), Kommentar zum Umweltrecht[2] (2019) § 3 UVP-G RZ 28.

[13] *Ennöckl* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 1 UVP-G 2000 RZ 17.

The procedure starts with the project applicant submitting the application for development consent to the assessing authority.[14] This includes the Environmental Impact Statement (EIS), which must provide different key information on the project as well as expected impact on the environment, tested alternatives or planned offsetting measures.[15] The EIS is not limited to investigate aspects relevant for the development consent, as the EIA not only serves to prepare the permission of the project, but also to optimise the project and to improve (public) acceptance.[16]

The project applicant must ensure that the EIS is drafted by competent experts.[17] Usually, the EIS consists of several independent impact statements, which are then combined into the EIS. The experts are commissioned by the project applicant and often include civil engineers, biologists, and energy experts, but also e.g., experts on (regional) economic development. It is not necessary that the experts are licensed as experts or civil engineers.[18]

Once the application process has started and all relevant documentation is available, the assessing authority must disclose the project documentation to the public.[19] During this public consolidation, everyone may submit a written statement regarding the planned project.[20]

Following the public consolidation phase, the assessing authority commissions experts of the subjects in question to prepare the Environmental Impact Report (EIR).[21] The EIR must not only evaluate the EIS and any other information submitted by the project applicant,[22] but also the statements made during the public consolidation phase.[23] Once the public consolidation period is finished and the EIR drafted, the authority must hold a hearing of the parties.[24]

1.1.5. Decision

After the hearing and conclusion of all available evidence, the assessing authority decides whether to issue a permit. Should there be no negative expected impacts, the project will be permitted without further stipulations.[25] If the overall assessment shows that serious environmental damages are to be expected that cannot be prevented or reduced to a tolerable level by stipulations, amendments or offsetting, the application must be rejected.[26] In all other cases, the authority will assess, whether the expected negative impacts are outweighed by expected positive impacts. In this case, the authority must balance different public interests against each other and decide, whether other public interests, e.g., a public interest to produce renewable energy, outweighs the interests of environmental protection.

Important to note is that the assessing authority must take its decision *ex ante.* As the project is yet to be finished, the authority must assess whether the expected impacts of the finished project will fulfil the requirements laid out by the UVP-G and relevant special administrative law based on the evidence acquired during the EIA.[27] The

[14] § 5 Abs 1 UVP-G; *N. Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 9 UVP-G 2000 RZ 3.

[15] § 6 UVP-G Abs 1.

[16] *Schmelz/Schwarzer*, UVP-G-ON 1.00 § 6 UVP-G (Stand 1.7.2011, rdb.at); *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 6 UVP-G 2000 RZ 3.

[17] § 6 UVP-G Abs 2.

[18] *Altenburger* in Altenburger (Hrsg), Kommentar zum Umweltrecht[2] (2019) § 6 UVP-G RZ 49.

[19] *Ennöckl/Raschauer/Bergthaler*, Kommentar zum UVP-G § 5 UVP-G RZ 5.

[20] § 9 UVP-G Abs. 1; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] § 9 RZ 14.

[21] § 12 UVP-G.

[22] § 12 Abs. 5 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar3 (2013) § 12 UVP-G 2000 RZ 3.

[23] § 12 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar3 (2013) § 9 UVP-G 2000 RZ 15.

[24] § 16 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 16 UVP-G 2000 RZ 2.

[25] This however is highly unlikely, as projects that are subjected to an EIA are by definition expected to have negative environmental impacts.

[26] § 17 Abs 5 UVP-G; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 17 UVP-G 2000 RZ 87.

[27] *Altenburger/Berger*, UVP-G: Umweltverträglichkeitsprüfungsgesetz; Kommentar zum UVP-G 2000 idF BGBl 2009/87[2] (2010) § 17 RZ 7; *Raschauer* in Ennöckl/Raschauer/Bergthaler (Hrsg), UVP-G: Kommentar[3] (2013) § 17 RZ 4.

authority is thereby forced to take a "prognostic decision" regarding the expected impacts and how they will affect specific public interests.[28]

1.2. Balanced interests

Conflicting interests often arise when e.g., economic stand against ecological interests, but it gets more complex if both negative and positive effects are of ecological nature. This can be seen by the example of projects related to the production of renewable energy, e.g., hydroelectric powerplants.[29] They often not only create conflicts with the environment, but also conflicts within the environment – so called inner-environmental conflicts.[30] Nevertheless, no matter which conflict prevails, the authority must reach a decision. To do this, it evaluates the expected impacts based on the available evidence.

While it is difficult to predict which actual impact a hydroelectric powerplant will have on e.g., a downstream population of *Anguilla anguilla*, [31] the same holds true for the expected benefits of a powerplant. Its efficiency is not only determined by its turbine power, but also by external factors such as river velocity or decreasing water levels due to climate change.[32] The same holds true for the expected economic benefits. They also depend on volatile external factors like general economic development, granted subsidies, or national and international energy policies.[33]

Although both positive and negative expected impacts are derived from complex calculations, are highly influenced by external factors, and show high degrees of uncertainty,[34] they differ in one key aspect: the way their results are presented. Positive impacts in favour of the project are usually presented in a numerical manner: in Gigawatts produced, Million Euros earned, or tons of CO_2-emissions saved.[35] Contrary, the negative impacts are seldomly represented in numbers. More often, they are characterized in terms such as "slight impact", "likely deterioration" or "probable risk of extinction".[36] Yet, the assessing authority must compare saved tons of CO_2 emissions with a likely extinction of a downstream *Anguilla anguilla* population.

1.3. (In)comparable Evidence

That comparing such different forms of evidence poses a challenge to the assessing authority has also been recognized by the Supreme Administrative Court (VwGH). It conceded that, when balancing different public interests against each other, the assessing authority must take a "valuing decision", as "the competing interests

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[28] *Raschauer* in Ennöckl/Raschauer/Bergthaler, Kommentar zum UVP-G § 17 RZ 4.

[29] Exemplary *Alge et al*, Jahrbuch des österreichischen und europäischen Umweltrechts 2010: Wasserkraft. Im Widerstreit öffentlicher Interessen (2017); *Bergthaler*, Energie und Umwelt oder: Die Rückkehr der Politik ins Umweltrecht, RdU 2014, 6, 121; *Ennöckl/Tichy*, Naturschutzrecht, in *Ennöckl/Niederhuber* (Hrsg), Umweltrecht Jahrbuch 2019 (2019), 189; *Klinglmair/Bliem*, Die Erschließung vorhandener Wasserkraftpotenziale in Österreich im Spannungsfeld von Energiepolitik und ökologischen Schutzzielen, in *Weizsäcker/Lindenberger/Höffler* (Hrsg), Interdisziplinäre Aspekte der Energiewirtschaft (2016), .

[30] Exemplary *Gärditz*, Ökologische Binnenkonflikte im Klimaschutzrecht, DVBl 2010, 214.

[31] Eels *(Anguilla Anguilla)* are a critically endangered species and highly affected by hydroelectric powerplants due to their long migration routes. Exemplary: *Ben Ammar et al*, Impact of downstream passage through hydropower plants on the physiological and health status of a critically endangered species: The European eel Anguilla anguilla, Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology 2021, 254, 110876. *Van Treeck et al*, The European Fish Hazard Index – An assessment tool for screening hazard of hydropower plants for fish, Sustainable Energy Technologies and Assessments, 2021, 43, 100903.

[32] Exemplary *Cao et al*, Raising awareness in model-based energy scenario studies—a transparency checklist, Energy, Sustainability and Society 2016, 6, 28; 113; *European Commission*, Guidance on the preparation of the EIA Report, 2017; *Gong et al*, Testing the scenario hypothesis: An experimental comparison of scenarios and forecasts for decision support in a complex decision environment, Environmental Modelling & Software 2017, 91, 135;

[33] *Crampton/Ockenfels*, Economics and Design of Capacity Markets for the Power Sector, in *Weizsäcker/Lindenberger/Höffler* (Hrsg), Interdisziplinäre Aspekte der Energiewirtschaft (2016); *Weimer-Jehle et al*, Context scenarios and their usage for the construction of socio-technical energy scenarios, Energy 2016, 111, 956.

[34] Exemplary *Bunn/Salo*, Forecasting with scenarios, European Journal of Operational Research 1993, 68, 3.

[35] Exemplary *Schrödl*, Gutachten zum Nutzen des Vorhabens und zum öffentlichen Interesse an dem Vorhaben PSW Koralm, 2018.

[36] Exemplary Umweltverträglichkeitsgutachten UVP Pumpspeicherkraftwerk Koralm, 112 f.

are usually not calculable and thus not concretely comparable based on numerical values".[37] While this seems questionable to some extent,[38] the VwGH further states that this non-calculability requires that the arguments for and against a project be recorded as "comprehensively and precisely as possible" and be "compared with each other to make the decision transparent and comprehensible".[39]

Yet, a current study on the balancing of interests within environmental matters has shown, that 90% of the observed cases were decided in favour of the project, [40] even though in many cases these interests were backed with less and weaker evidence.[41] The authors further emphasize, that in most of the investigated cases, the assessing authority did not collect the arguments "as comprehensively and precisely as possible". Contrary, the assessing authorities often did not explain why the realization of a project was ought to be more beneficial than the protection of the environment, and factual comparison was missing.[42]

1.4. Framed decisions

While there are many different explanatory approaches to why authorities may decide in favour of a project, the different ways in which the available evidence is presented could play a more crucial role than currently assumed. A vast body of research shows, that human decision-making processes are often more influenced by the framing of evidence than its actual content.[43] These known "imperfections of human perception and decision"[44] unfortunately do not exclude humans who are permitting hydroelectric powerplants.

There has been extensive research on "persuasive models",[45] "seductive simulations",[46] "trust in numbers",[47] or how to "escape model land"[48] in economics, environmental and social sciences, psychology, science, and technology studies and many more. Yet, apart from a few exemptions,[49] the legal field has until now successfully evaded a discussion on how the presentation or framing of evidence might be influencing legal decisions.[50] This partly changed during the COVID-19 pandemic. Here, legal scholars became aware of evidence being presented as dashboards, maps, charts etc. and then being used by decision-makers as an almost uncontested line of

[37] VwGH 21.11.1994, 94/10/0076, similar VwGH 28.06.1993, 93/10/0019 and VwGH 24.10.1995, 94/07/0135; *Stolzechner* 2000, S 9; vgl *Schulev-Steindl/Romirer*, Interessenabwägung im Naturschutzrecht, RdU 2019, 5, 187 (189).; these assumptions however stand in contrast to valuation concepts such as Ecosystem Services Valuation.

[38] See e.g. the concept of valuing ecosystem services by *Pearce/Moran*, The economic value of biodiversity (1997).

[39] VwGH 21.11.1994, 94/10/0076; *Stolzlechner*, Verwaltungsrechtliche Abwägungsentscheidung, ZfV 2000, 2, 2014 (9).

[40] *Schulev-Steindl/Romirer*, Interessenabwägung im Vorarlberger Naturschutzrecht. Funktion, Dimensionen und Evaluierung, 2019; *Schulev-Steindl/Romirer*, RdU 2019, 5, 187.

[41] *Schulev-Steindl/Romirer*, Interessenabwägung im Vorarlberger Naturschutzrecht. Funktion, Dimensionen und Evaluierung, 2019, (71).

[42] *Schulev-Steindl/Romirer*, RdU 2019, 5, 192.

[43] Exemplary *Gigerenzer*, How to Improve Bayesian Reasoning Without Instruction: Frequency Formats, 1995, 21; *Godau/Vogelgesang/Gaschler*, Perception of bar graphs – A biased impression?, Computers in Human Behavior 2016 ,59, 67; *Gong et al*, Testing the scenario hypothesis: An experimental comparison of scenarios and forecasts for decision support in a complex decision environment, Environmental Modelling & Software 2017, 91, 135; *Manski*, Communicating uncertainty in policy analysis, Proceedings of the National Academy of Sciences 2019, 116, 7634; *Pedersen/Larsen*, Putting a Number on Preferences: How Numerical Attitudes Are Shaped by Ideology and Equivalency Framing, International Journal of Public Opinion Research 2019, 31, 528; *Tversky/Kahneman*, The Framing of Decisions and the Psychology of Choice, Science 1981, 211, 453; *Weimer-Jehle et al*, Context scenarios and their usage for the construction of socio-technical energy scenarios, Energy 2016, 111, 956.

[44] *Tversky/Kahneman*, Science 1981, 211, 453.

[45] See *Alonso/Camara*, Persuading Voters, American Economic Review 2016, 106, 3590.

[46] See *Lahsen*, Seductive Simulations? Uncertainty Distribution Around Climate Models, Social Studies of Science, 2005, 35, 895.

[47] See *Porter*, Trust in numbers: the pursuit of objectivity in science and public life (2020).

[48] See *Thompson*, Escape from model land: how mathematical models can lead us astray and what we can do about it (2022).

[49] Exemplary *Eisenberger*, Prognosemodelle und generelles Verwaltungshandeln, ÖJZ 2022, 51, 418; *Eisenberger/Merli*, Automatisierung, Algorithmen und künstliche Intelligenz in der öffentlichen Verwaltung. Eine Positionsbestimmung, Journal für Rechtspolitik 2023, 31, 25; *Lehr/Ohm*, Playing with the Data: What Legal Scholars Should Learn About Machine Learning 2017, 51, 65; *Brownsword*, Rethinking law, regulation, and technology (2022).

[50] Exemplary *Jasanoff*, Science at the bar: law, science and technology in American law (1997).

reasoning.[51] However, until now, there has been no extensive research on how the presentation and framing of evidence influences legal decisions.

2. Description of the doctoral project

In my doctoral project, I therefore want to investigate how the framing of evidence influences legal decisions. The goal is to draw a broader conclusion on how framings of evidence are incorporated in legal decision-making-processes, and how such framings could be identified by the decisionmakers. I chose EIAs of hydroelectric powerplants as an example because the transformation of the energy system as a socio-technical system not primarily depends on data or correct calculations, but rather on the accompanying belief-system.[52] Additionally, hydroelectric powerplants often cause irreversible ecological damages, while simultaneously producing vast amounts of energy. This makes them a contested subject of investigation, as they draw both positive and negative framings.[53]

3. Methodological Approach

I will first identify existing frames (both positive and negative) in the EIA documentation of selected hydroelectric powerplants by conducting a qualitative content analysis by *Mayring*, following the methodology laid out by *Oswald*.[54] Starting from the Environmental Impact Statement provided by the project applicant, I will trace the identified frames throughout the EIA procedure to identify if and which frames are reproduced by the assessing authority in the final permit.

After identifying and tracking existing frames, I will investigate which evidence is particularly left out and if this left out information correlates with a preference for numerical evidence. Drawing on concepts of Vignette Technique,[55] I will then select a small sub-set of the identified frames and re-frame the existing evidence by using methods from science communication and data visualisation. By this, I want to showcase the frames used and reproduced in EIA assessments and thus lay the foundation for further research into how framing of numerical evidence influences legal decisions.

I will assess the EIA documentation of five hydroelectric powerplants that were issued a positive EIA since 2020. The timeframe is relevant, as the ombudsman for the economic location ("Standortanwalt") has only been introduced to the UVP-G by amendment BGBl. I Nr. 80/2018. The assessed powerplants are distributed over five different Austrian provinces, the required documentation has already been collected.

Assessed plants:

- Speicherkraftwerk Kühtai (Tyrol)
- Pumpspeicherkraftwerk Limberg III (Salzburg)

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[51] The project "REASON" traces to which extent political decision makers used statistical models to support measures in connection with the COVID-19 crisis in Austria. https://id.univie.ac.at/en/team/projects/reason/, last accessed 27.06.2023.

[52] Exemplary *Davidson/Gross*, The Oxford handbook of energy and society (2018); *Carrington/Stephenson*, The politics of energy scenarios: Are International Energy Agency and other conservative projections hampering the renewable energy transition?, Energy Research & Social Science 2018, 46, 103; *Hamann et al*, An interdisciplinary understanding of energy citizenship: Integrating psychological, legal, and economic perspectives on a citizen-centred sustainable energy transition, Energy Research & Social Science 2023, 97, 102959; *Morgan/Keith*, Improving the way we think about projecting future energy use and emissions of carbon dioxide, Climatic Change 2008, 90, 189; *Schmidt-Scheele*, 'Plausible' energy scenarios?! How users of scenarios assess uncertain futures, Energy Strategy Reviews 2020, 32, 100571; *Weimer-Jehle et al*, Energy 2016, 111, 956; *Schubert/Thuß/Möst*, Does political and social feasibility matter in energy scenarios?, Energy Research & Social Science 2015, 7, 43.

[53] Exemplary *Ahlers et al*, Framing hydropower as green energy: assessing drivers, risks and tensions in the Eastern Himalayas, Earth System Dynamics 2015, 6, 195.

[54] *Mayring*, Qualitative Inhaltsanalyse: Grundlagen und Techniken[13] (2022); *Oswald*, Strategisches Framing: eine Einführung[2] (2022) 191 f.

[55] *Alexander/Becker*, The Use of Vignettes in Survey Research, The Public Opinion Quarterly 1978, 42, 93; *Finch*, The Vignette Technique in Survey Research, Sociology 1987, 21, 105; *Payton/Gould*, Vignette Research Methodology: An Essential Tool for Quality Improvement Collaboratives, Healthcare 2022, 11, 7.

- Pumpspeicherwerk Koralm (Styria)
- Kraftwerk Obervellach II (Carinthia)
- Pumpspeicherkraftwerk Obervermuntwerk II (Vorarlberg)

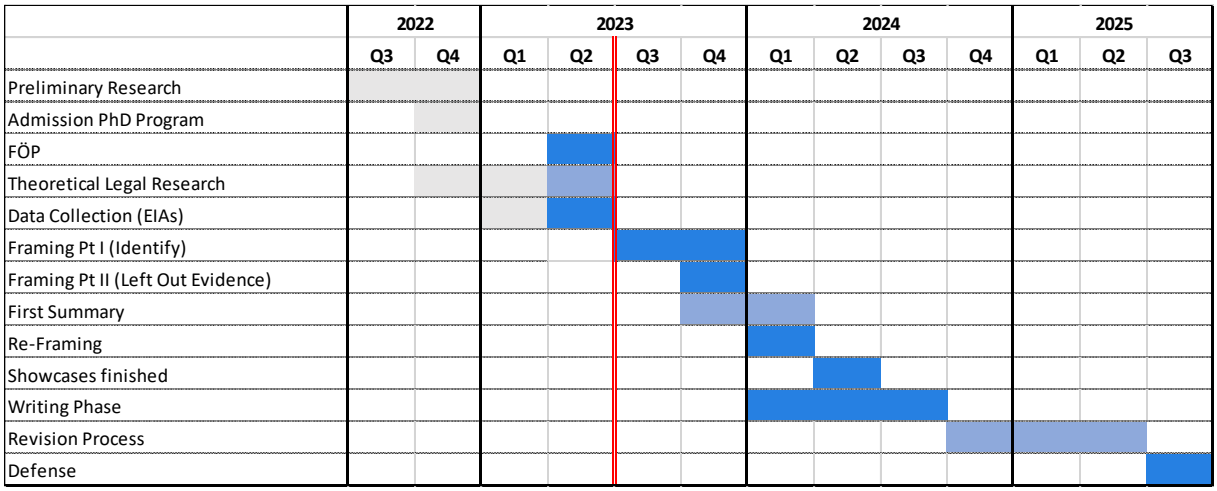
4. Research Questions

1. Which frames can be identified in the EIA documentation of hydroelectric powerplants, and which of those are reproduced by the assessing authority in the issued permits?

2. Do these frames correlate with a preference for numerical evidence, and how does this translate into legal decisions?

3. Does this reproduction of frames by the assessing authority require corrective actions to ensure legally compatible decisions?

5. Time and work schedule



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