

2012

## Reverse Environmental Impact Analysis: Effect of Climate Change on Projects

Michael B. Gerrard

*Columbia Law School*, [michael.gerrard@law.columbia.edu](mailto:michael.gerrard@law.columbia.edu)

Follow this and additional works at: [https://scholarship.law.columbia.edu/faculty\\_scholarship](https://scholarship.law.columbia.edu/faculty_scholarship)



Part of the [Environmental Law Commons](#)

---

### Recommended Citation

Michael B. Gerrard, *Reverse Environmental Impact Analysis: Effect of Climate Change on Projects*, 247(45) N.Y.L.J., MARCH 8, 2012 (2012).

Available at: [https://scholarship.law.columbia.edu/faculty\\_scholarship/3080](https://scholarship.law.columbia.edu/faculty_scholarship/3080)

This Article is brought to you for free and open access by the Faculty Publications at Scholarship Archive. It has been accepted for inclusion in Faculty Scholarship by an authorized administrator of Scholarship Archive. For more information, please contact [scholarshiparchive@law.columbia.edu](mailto:scholarshiparchive@law.columbia.edu).

## ENVIRONMENTAL LAW

## Expert Analysis

# Reverse Environmental Impact Analysis: Effect of Climate Change on Projects

**E**nvironmental impact statements (EISs) examine the effect of the proposed action—typically a construction project, but sometimes a government policy or other activity—on the environment. However, increasing attention is now devoted to looking in the other direction—at how changes in the environment might affect a project.

Reverse environmental impact analysis, as I will call it, has been with us for some time. For example, if a building is planned downwind of a smokestack or downstream of a contaminated groundwater plume, this effect of the outside world has long been considered. However, the emergence of scientific understanding of climate change is shining a light on the issue. For example, if during the expected lifetime of a proposed building, its site may be endangered by sea level rise, should this be disclosed in the EIS, so that governmental decision-makers can consider this prospect before granting approvals?

This article explores the protocols that various government agencies have issued for reverse environmental impact analysis. It then discusses one pending case on the issue. It reports on a survey that investigated whether and how reverse environmental impact analysis is being performed in recent EISs, and it summarizes the analysis in a number of EISs.

### Protocols

The National Environmental Policy Act of 1970 (NEPA) created the Council on

---

MICHAEL B. GERRARD is *Andrew Sabin Professor of Professional Practice and director of the Center for Climate Change Law at Columbia Law School, and senior counsel with Arnold & Porter LLP. PATRICK WOOLSEY and ELIZABETH SHEARGOLD, students at Columbia, assisted in the research for this article.*

By  
**Michael B.  
Gerrard**



Environmental Quality (CEQ) and authorized it to issue implementing rules. In February 2010 CEQ issued the “Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions.” It suggests that when relevant an EIS should consider “[t]he relationship of climate change effects to a proposed action or alternatives, including the relationship to proposal design, environmental impacts, mitigation and adaptation measures.”

The draft points out that under longstanding NEPA regulations,<sup>1</sup> the current and future state of the proposed action’s “affected environment” is considered, and it should be no different for “the observed and projected effects of climate change.” It specifies that “[c]limate change effects should be considered in the analysis of projects that are designed for long-term utility and located in areas that are considered vulnerable to specific effects of climate change (such as increasing sea level or ecological change) within the project’s time frame. For example, a proposal for long-term development of transportation infrastructure on a coastal barrier island will likely need to consider whether environmental effects or design parameters may be changed by the projected increase in the rate of sea level rise.”

These draft CEQ guidelines were released for public comment two years ago. There has been no announcement of when they will be finalized.

In October 2010 the New York Department of Environmental Conservation (DEC) issued the Commissioner’s Policy on

Climate Change and DEC action.<sup>2</sup> It directs DEC staff “to incorporate climate change adaptation strategies into DEC programs, actions and activities, as appropriate.” In doing so, EISs prepared under the State Environmental Quality Review Act (SEQRA) should “[i]dentify potential adverse impacts from climate change,” and “[i]n analyses and decision-making, use best available scientific information of environmental conditions resulting from the impacts of climate change (e.g., increased air and water temperatures, decreased air quality, sea level rise and increased coastal flooding); incorporate adaptive management into program planning and actions, which uses scientifically based and measurable evaluation, testing of alternate management approaches, and readjustment as new information becomes available.”

---

Increasing attention is now devoted to looking at how changes in the environment might affect a project.

Preparation of EISs under New York City’s City Environmental Quality Review (CEQR) procedure is guided by the CEQR Technical Manual. That document now has detailed protocols for consideration of greenhouse gas emissions resulting from projects.<sup>3</sup> However, it does not have standards for the analysis of the effects of climate change on proposed projects. It says that the Mayor’s Office of Environmental Coordination “should be consulted about the scope of climate change analyses in CEQR reviews. At the same time, where appropriate, the potential for a proposed project to result in a significant adverse impact on the environment as a result of the anticipated

effects of climate change may be qualitatively discussed in environmental review. For example, if a proposed project that includes storage of hazardous materials is located in a floodplain, the possibility of flooding and, to the extent warranted, methods to prevent adverse effects on the surrounding area in such an event, such as raising or flood proofing storage areas, should be discussed.”

### Non-U.S. Protocols

Official and unofficial protocols for consideration of climate impacts on projects in environmental impact assessment and similar processes have been prepared in several other countries, including Canada,<sup>4</sup> the United Kingdom,<sup>5</sup> Australia,<sup>6</sup> and Kiribati.<sup>7</sup> Some of the most detailed guidance is from the Netherlands.<sup>8</sup>

Organizations providing international development assistance have also issued guidelines for consideration of the impacts of climate change on projects. These include the U.S. Agency for International Development,<sup>9</sup> the World Bank,<sup>10</sup> the Inter-American Development Bank,<sup>11</sup> and the Caribbean Development Bank.<sup>12</sup> The Organization for Economic Cooperation and Development (OECD) has guidance as well.<sup>13</sup>

### Pending Litigation

The California Environmental Quality Act (CEQA) is very similar to SEQRA. Section 15126.2(a) of the CEQA guidelines states that in addition to assessing the impacts of a proposed project on the environment, an environmental impact report (EIR, the California equivalent of an EIS) “shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. *Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazard areas.*” (The italicized language was added in 2010.)

This language is the subject of an important litigation now pending. The case

concerns a proposed mixed-use real estate development project in Marina del Rey in Los Angeles County. Its EIR was challenged by several environmental groups. The trial court dismissed the challenge. In November 2011, the California Court of Appeals ruled that the just-quoted guidelines are invalid on the grounds that they are inconsistent with the CEQA statute.<sup>14</sup> This language was added in February 2010 in response to SB 97, legislation passed by the California Legislature and signed by former Governor Arnold Schwarzenegger in 2007 which amended CEQA to require the California Office of Planning and Research to create and implement guidelines for the consideration of greenhouse gas emissions or the effects of greenhouse gas emissions.<sup>15</sup>

---

Airport EISs rarely address the impacts of climate change, although many airports are located in low-lying wetland or floodplain areas which might be increasingly vulnerable to inundation due to climate change.

Nonetheless, the court found that “the purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project.” It held that “identifying the environmental effects of attracting development and people to an area is consistent with CEQA’s legislative purpose and statutory requirements, but identifying the effects on the project and its users of locating the project in a particular environmental setting is neither consistent with CEQA’s legislative purpose nor required by the CEQA statutes.” The plaintiffs and several others are now asking the California Supreme Court to take the case and to reverse it.

### Consideration in Federal EISs

The impacts of climate change and adaptation to them appear in a variety of places in EISs—as part of the affected environment, as a cumulative effect, and incorporated more generally into the analysis of environmental consequences. There is considerable divergence with respect to how EISs treat uncertainty about local or regional climate projects, and how (if at all) climate projections are linked to the analysis of the effects of the project under study.<sup>16</sup>

The Center for Climate Change Law has been conducting a survey of the treatment of climate change impacts in EISs prepared under NEPA.<sup>17</sup> The results show that such analysis is spotty at best.

EISs prepared for new highway projects generally do not address the impacts of climate change. Of 18 highway EISs published in the last three years which mention climate change, only four consider the impact of climate change on the project.

Climate impacts are considered in a 2011 EIS for the Interstate 5 Columbia River Crossing Project, a bridge and highway proposal in Vancouver, Wash.<sup>18</sup> The EIS evaluates climate change projections specific to the region, identifies the variable conditions that are expected to result from climate change, and assesses the project’s resiliency to climate change impacts. Impacts addressed include temperature and precipitation changes, altered seasonal river flow, and increased flooding. The vulnerability of the Columbia River Bridge to these impacts is assessed, and a bridge design is proposed which would accommodate higher floodwater levels.

A 2009 EIS for a highway construction project in Cleveland, Ohio, also includes a discussion of the impacts of climate change.<sup>19</sup> The EIS cites a report from the Transportation Research Board on the potential impacts of climate change on U.S. transportation,<sup>20</sup> and notes that in northern inland areas such as Ohio, increased temperature extremes are likely to damage transportation infrastructure. More frequent freezes and thaws and extreme heat are expected to degrade the integrity of pavement and bridges and result in increased maintenance costs. Impacts of this type are expected to affect roadways throughout the entire northern United States.

Airport EISs rarely address the impacts of climate change, although many airports are located in low-lying wetland or floodplain areas which might be increasingly vulnerable to inundation due to climate change. For example, a 2011 EIS for the expansion of Palm Beach Airport in Florida briefly addresses airport emissions but makes no mention of the potential impacts of climate change on the project, despite the airport’s coastal location and the region’s projected vulnerability to sea level rise and increased storm intensity.<sup>21</sup> Of five airport EISs published in the last three years which mention climate change, only one (produced by the National Park Service) analyzes climate impacts on the

airport, while the FAA does not address the topic in its EISs.

For federal EISs involving transportation infrastructure projects in New York State, only a few addressed climate change, and none address the impacts of climate on the project. The most recent example is a draft EIS for the replacement of the Tappan Zee Bridge, which was released in January 2012.<sup>22</sup> It includes discussion of construction emissions, traffic impacts on climate change and mass transit options, but makes no mention of climate impacts on the project.

A 2009 Federal Highway Administration (FHWA) EIS for a major highway expansion at Fort Drum, N.Y., briefly mentions emissions from construction and traffic impacts, but makes no mention of climate impacts on the project. The same is true of a 2008 FHWA EIS for the Kosciuszko Bridge Project on the Brooklyn-Queens Expressway. Earlier federal EISs for highway projects in New York do not address climate change.

A 2010 Nuclear Regulatory Commission (NRC) EIS for the license renewal application for the Indian Point generating station includes a discussion of the impacts of climate change on Hudson River aquatic resources, but does not address potential impacts of climate change on the plant itself. Although it includes a public comment regarding the potential of climate change to increase storm intensity and thus heighten the risk of damage to the facility, NRC did not substantively address the issue in its response.

## New York EISs

Only a small handful of EISs prepared under SEQRA addressed the effects of climate change. For example, a draft EIS for the Luyster Creek Energy Project at the Astoria Generating Station in Queens addresses potential impacts of climate change on the project as well as greenhouse gas emissions.<sup>23</sup> The EIS discusses the impacts of sea level rise and storm surges on the waterfront project site, and outlines their connection to climate change. As a proposed mitigation measure, the facility will be elevated above projected flood levels.

The Haverstraw water supply project would treat Hudson River water for use as drinking water. The draft EIS addresses impacts of global climate change on the project in substantial depth.<sup>24</sup> It notes that climate change may increase precipitation variability and the frequency and intensity of periods of drought, and describes the effects that these might have on

eutrophication and salinity. Increased salinity or reduced water quality would require the implementation of more intensive water treatment technology. The draft EIS also states that increased flooding from climate change might impact the project, and that the treatment plant will be built at a higher elevation than 500-year maximum flood levels.

An EIS for the rehabilitation of Cedar Grove Beach on Staten Island notes that the beach, jetties and buildings on the site are extremely vulnerable to sea level rise and increased storm intensity.<sup>25</sup> These risks are analyzed in detail. Many of the buildings were damaged by Hurricane Irene, and the Parks Department has concluded that the risk of future storm damage is so high that the most cost-effective solution is to demolish the buildings rather than restore them. However, the EIS makes no mention of the role played by climate change in contributing to sea level rise and storm events.

Climate impacts were also discussed in the EISs for the redevelopment of Governors Island<sup>26</sup> and for the Willets Point project in Queens.<sup>27</sup>

At the other end of the world, many EISs prepared in Australia consider climate impacts on projects. Some examples include the EISs for a coal mine,<sup>28</sup> the expansion of a uranium mine,<sup>29</sup> and a railway.<sup>30</sup>

## Conclusion

Emerging guidelines are calling for the consideration of climate change impacts in EISs, and actual EIS practice is slowly coming along. The pending litigation in California, however, threatens to reverse this progress in the state that has been in the forefront of much environmental regulation.

.....

1. 40 CFR §1502.15.
2. [http://www.dec.ny.gov/docs/administration\\_pdf/commissclimchpolicy.pdf](http://www.dec.ny.gov/docs/administration_pdf/commissclimchpolicy.pdf).
3. [http://www.nyc.gov/html/oec/downloads/pdf/2012\\_ceqr\\_tm/2012\\_ceqr\\_tm\\_ch18\\_greenhouse\\_gas\\_emissions.pdf](http://www.nyc.gov/html/oec/downloads/pdf/2012_ceqr_tm/2012_ceqr_tm_ch18_greenhouse_gas_emissions.pdf).
4. <http://www.cefconsultants.ns.ca/CCGuideLandUseNov05.pdf>; [http://www.iaia.org/IAIA-Climate-Symposium-DC/documents/Canada\\_Guide\\_EIA\\_CC.pdf](http://www.iaia.org/IAIA-Climate-Symposium-DC/documents/Canada_Guide_EIA_CC.pdf) at Sec. 2.2.
5. [http://www.iaia.org/IAIA-Climate-Symposium-DC/documents/UK\\_strategy\\_climate\\_change\\_guidance\\_2007.pdf](http://www.iaia.org/IAIA-Climate-Symposium-DC/documents/UK_strategy_climate_change_guidance_2007.pdf) at 13.
6. <http://www.iaia.org/IAIA-Climate-Symposium-DC/documents/Australia%20NTG%20EIA%20and%20GHG%20Emissions.pdf> at 3; <http://www.planning.nsw.gov.au/LinkClick.aspx?fileticket=VYjmQirQIAk%3d&tabid=177&language=en-US>; <http://www.vcc.vic.gov.au/vcs.htm>.
7. <http://www.climate.gov.ki/pdf/Adaptation/KAP%20Adaptation%20Handbook.pdf>; <http://www.climate.gov.ki/pdf/Adaptation/KAP%20Risk%20>

- Assessment%20Handbook.pdf.
8. [http://www.espace-project.org/publications/Extension%20Outputs/EA/Espace%20Final\\_Guidance\\_Finalv5.pdf](http://www.espace-project.org/publications/Extension%20Outputs/EA/Espace%20Final_Guidance_Finalv5.pdf); <http://docs1.eia.nl/cms/Climate%20change%20in%20water%20management%202010.pdf>.
9. [http://pdf.usaid.gov/pdf\\_docs/PNADJ990.pdf](http://pdf.usaid.gov/pdf_docs/PNADJ990.pdf).
10. <http://siteresources.worldbank.org/INTSAFEPOL/1142947-1116497123103/20507401/Chapter2GlobalAndCrossSectoralIssuesInEA.pdf> at 32-33; <http://siteresources.worldbank.org/EXTCC/Resources/407863-1219339233881/DCCSFTechnicalReport.pdf>.
11. <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=35149039>.
12. [http://www.preventionweb.net/files/8263\\_Source20Book51.pdf](http://www.preventionweb.net/files/8263_Source20Book51.pdf) at 31.
13. [http://www.klimatilpasning.dk/Documents/OECD\\_adaptation\\_EIA.pdf](http://www.klimatilpasning.dk/Documents/OECD_adaptation_EIA.pdf).
14. *Ballona Wetlands Land Trust v. City of Los Angeles*, 201 Cal. App. 4th 455 (2d Dist. 2011).
15. Cal. Pub. Res. Code §21083.05(a).
16. Katrina F. Kuh, "Impact Review, Disclosure, Planning," ch. 15 in "The Law of Adaptation to Climate Change: U.S. and International Aspects" (Michael B. Gerrard and Katrina F. Kuh, eds., American Bar Association, forthcoming 2012).
17. A matrix summarizing the impacts discussed in EISs, databases on NEPA and CEQR EISs, and numerous EIS protocols are available at <http://www.law.columbia.edu/centers/climatechange/resources/eis>.
18. [http://www.columbiarivercrossing.org/FileLibrary/FINAL\\_EIS\\_PDFs/CRC\\_FEIS\\_Chapter3\\_S19\\_Cumulative\\_Effects.pdf](http://www.columbiarivercrossing.org/FileLibrary/FINAL_EIS_PDFs/CRC_FEIS_Chapter3_S19_Cumulative_Effects.pdf).
19. [http://www.dot.state.oh.us/projects/ClevelandUrbanCoreProjects/Innerbelt/FEIS/CIB\\_FEIS\\_7-21-09.pdf](http://www.dot.state.oh.us/projects/ClevelandUrbanCoreProjects/Innerbelt/FEIS/CIB_FEIS_7-21-09.pdf).
20. <http://onlinepubs.trb.org/onlinepubs/sr/sr290.pdf>.
21. <http://www.pbias-eis.com/pdf/final-eis/Chapter5.0.pdf>.
22. [http://www.tzbsite.com/tzbsite\\_2/deis\\_2.html](http://www.tzbsite.com/tzbsite_2/deis_2.html).
23. <http://www.uspowergen.com/download/134/>.
24. [http://haverstrawwatersupplyproject.com/images/stories/deis%202012/DEIS/DEIS\\_16\\_Global\\_Climate\\_Change.pdf](http://haverstrawwatersupplyproject.com/images/stories/deis%202012/DEIS/DEIS_16_Global_Climate_Change.pdf).
25. [http://www.nycgouparks.org/parks/R016/map/Cedar\\_Grove\\_FEIS.pdf](http://www.nycgouparks.org/parks/R016/map/Cedar_Grove_FEIS.pdf).
26. [http://www.nyc.gov/html/oec/downloads/pdf/dme\\_projects/11DME007M/FGEIS/11DME007M\\_FGEIS\\_17\\_Greenhouse\\_Gases.pdf](http://www.nyc.gov/html/oec/downloads/pdf/dme_projects/11DME007M/FGEIS/11DME007M_FGEIS_17_Greenhouse_Gases.pdf).
27. The discussion appears in the Response to Comments section. [http://www.nyc.gov/html/oec/downloads/pdf/dme\\_projects/07DME014Q/FGEIS/07DME014Q\\_FGEIS\\_29\\_RTC.pdf](http://www.nyc.gov/html/oec/downloads/pdf/dme_projects/07DME014Q/FGEIS/07DME014Q_FGEIS_29_RTC.pdf), pp. 29-90 - 29-94.
28. <http://hancockcoal.com.au/go/alpha-coal-eis>, Volume 2, Sec. 14.3.
29. <http://www.bhpbilliton.com/home/aboutus/regulatory/Documents/odxEisChapter8MeteorologicalEnvironmentAndClimate.pdf>.
30. [http://www.crossriverrail.qld.gov.au/index.php?option=com\\_content&view=article&id=152%3Avo-lume-1&catid=49&Itemid=175](http://www.crossriverrail.qld.gov.au/index.php?option=com_content&view=article&id=152%3Avo-lume-1&catid=49&Itemid=175), chapter 6.