

historic emissions) may provide a suitable benchmark against which to compare project emissions. In other cases, you may determine that a modified reference case is more appropriate. Even if you choose to use a modified reference case, you still may wish to provide your historic emissions data to enable users of the EPAAct 1605(b) database to evaluate the reported emissions reductions efforts with respect to a historic baseline.

**Basic.** The basic reference case uses only historical data. Emissions from the project or sequestration levels may be compared with the corresponding emissions or sequestration level for some previous year(s), for example, (1) the 1987 to 1990 period, the period that EPAAct Section 1605(b)(1)(A) describes as the baseline years for purposes of reporting emissions; (2) the year(s) just prior to commencement of the emissions reductions project; or (3) some intervening year(s) more representative of normal operations. The reference case may be defined as the average annual emissions during some multiyear period or the highest or lowest annual emissions during that time. Alternatively, you could choose a single reporting year (for example, 1990) as the reference case year.

**Modified.** The modified reference case recognizes that even in the absence of your project, your future emissions levels may differ from past levels. The emissions or sequestration levels in the reference case may differ from historical levels because of gradual, predictable changes or because of abrupt changes. Gradual changes in emissions might occur because of growth or decline in industrial output, slowly changing technologies, or natural processes, such as natural regeneration of clear-cut forests. In the case of expanding output or operations, you might extrapolate the reference case from past trends and external data to determine what emissions would have been in the year in which the project's effects are being measured. This process may involve using models and adjusting for growth over time. You could estimate the reference case emissions using historic or current-year data and adjusting for future growth by multiplying the historic emissions rate (emissions per unit of production) by the units produced in the reporting year.

A modified reference case based on a hypothetical, abrupt, external change presents a greater challenge for the reporter. For example, a reference case for a forest preservation project might be built on the assertion, "The forest would have been cut if we had not taken actions to preserve it." If you use this type of reference case, you should take extra care to document the facts underlying the case and to build a sound explanation about why this is the appropriate reference case to use in developing your analysis.

Reference cases for projects involving new operations or added capacity may lie between the two extremes of abrupt changes and gradual changes. For these activities, you will also need to exercise care in constructing a credible modified reference case. Use of industry standards or alternatives actually considered in the planning stages will build credibility. For example, if in the construction of a new building you exceed

existing building standards for energy efficiency, you could justifiably assert that the reference case for that project is a building that just meets the standards.

#### Case 1: Rarotonga Coconut Cream, Inc.—Reference Case

RCCI decided to use a basic reference case. Managers reasoned that, in the absence of the shift to the distillate oil-fired cogeneration system, they would have continued using the residual oil-fired boiler and purchased electricity. Because its production levels had been constant over the past seven years, RCCI felt no need to modify the historic levels of energy use to reflect expected future trends. Instead, it decided to use an average of its emissions for 1989 and 1990, the earliest two years for which it had energy use records. Consistent with the RCCI project description, the reference case only incorporated the plant's electrical, processing, and steam production systems.

#### Case 2: Rural-Urban Office Management, Inc.—Reference Case

RUOMI chose to use a basic reference case, averaging its emissions for the years 1993 to 1995. There were several reasons for this decision. Because the use patterns and demands of RUOMI's tenants had changed dramatically from 1980 to 1990, the years 1987 to 1990 (or an average of these years), would not have been an appropriate indicator of expected emissions in the late 1990s. However, by 1992, RUOMI had established many long-term contracts with its tenants. Energy-use patterns had stabilized, and there was no reason to expect significant shifts in the foreseeable future. The company chose to average the years 1993 to 1995 because the first three months of 1994 included unusually cold weather and were not indicative of general energy demands. While its emissions reductions would have appeared larger if RUOMI had used only 1994 as a reference case, company officials were informed by the Metropolis energy planner that the reports could lose credibility if they only compared their project's energy use and emissions levels to a worst-year reference case.

#### Case 3: Illinois-Ohio, Unlimited—Reference Case

IOU's project was clearly driven by increased demands for its product. This immediately suggested that past emissions levels would not be a good model of what would have been, but for the project. Therefore, the utility chose to use a modified reference case to reflect the growth in peaking demand it was experiencing. However, IOU also recognized that it was operating in an environment where a company's current emissions are often compared to some historic level. Therefore, IOU decided to report both historic 1987 to 1990 emissions levels, and the modified reference case reflecting its changing customer demands.

#### GG-5.2 What Effects Did the Project Have?

The second major step in project analysis is identifying effects of the project. Your report should address all the effects that you can identify—not just the obvious, intended

effects, but also less noticeable, unintended effects. Effects you should consider include activity shifting (moving processes within your organization), outsourcing (purchasing commodities or services you formerly produced), life cycle emissions shifting (upstream and downstream changes in processes or materials used), and market effects (offsets to achievements caused by residual demand).

**Example:** An electricity conservation project reduces electricity use at an industrial site and associated carbon dioxide emissions at the utility. However, the utility's emissions of other greenhouse gases, such as methane and nitrous oxide, will be reduced as well. In addition, conserving electricity may lead to other effects within the utility's transmission and distribution system. All of these effects should be identified (and quantified, where possible).

**Example:** Closing an industrial plant will likely reduce on-site emissions. However, if another plant is opened or expanded to meet market demand for the former plant's products, the increase in emissions from the new plant would at least partially offset the decrease in emissions resulting from the closing. To place the overall effects of the closing in context, emissions associated with the replacement production capacity should be identified and quantified to the extent possible.

**Example:** Shifting an activity to another part of your organization or substituting your production of a commodity with its purchase from others may appear to reduce your emissions. Manufacturing a component at a subsidiary's plant, or the purchase of power by a utility for distribution to customers, however, are some examples in which net emissions may not have changed. The emissions associated with the shifted or substitute production activity should be taken into account, regardless of where it occurs.

**Example:** Manufacturers can switch from steel to aluminum and claim reductions because working with aluminum results in fewer emissions. However, the production of the aluminum itself creates emissions different from those associated with the production of the steel. Both the on-site changes and the upstream changes should be considered when you analyze whether you have emissions reductions to report under this voluntary reporting program.

**Example:** Extending the rotation length or completely precluding harvesting at a given forest location increases the carbon storage services at that site. However, the added sequestration may be largely offset if another site is harvested earlier than it otherwise would have been to meet the market demand for timber that was not met by timber from the first site.

Effects you can identify should be reported. These would include any on-site effects resulting from changes in both fuel combustion and electricity use. Off-site effects may be more problematic. In some situations, you may have relationships with customers or suppliers that allow you to both identify and estimate effects that occur outside your organization. If you have or can get such information, you should report it.