



# Low carbon concrete in Clean Water State Revolving Fund projects

DEQ's Clean Water State Revolving Fund can offer principal forgiveness on loans of up to 50 percent, but not exceeding \$500,000, of the project costs associated with using low carbon concrete or other "green" materials in wastewater and stormwater projects.

## Why focus on concrete?

- Large greenhouse gas emissions – concrete comprises approximately 1 percent of our total emissions in 2015, according to [Oregon's Consumption Based Emissions Inventory](#) – a significant amount for one material
- Large reduction potential – there are cost-effective materials and methods for lowering the impact of concrete. Concrete producers are knowledgeable of these methods and can achieve up to 40 percent carbon reductions on certain mix designs
- High demand – concrete has few substitutes in modern infrastructure and buildings
- Locally produced – greater opportunity to make a change in our communities
- Engaged industry – active measurement and disclosure programs at the national and regional level

## Low carbon concrete criteria

Projects must meet the performance criteria described below to be eligible for principle forgiveness.

Meet one of the following:

1. More than 300 cubic yards of ready mix concrete used on the project
2. More than 15% of project costs attributed to ready mix concrete, which is inclusive of materials, labor and testing.

## Project performance

Using Environmental Product Declarations (EPDs) for proposed concrete mixes, projects must demonstrate a 10% reduction below the most recent National Ready Mix Concrete Association's [Pacific Northwest Benchmarks \(Table E5\)](#).

## Project compliance

There are two paths of compliance based on your project details:

- 1) Submit an EPD to DEQ for each mix used that shows a 10% Global Warming Potential (GWP) reduction below the NRMCA Pacific Northwest Benchmarks.
  - a. All mixes used must have EPDs that are third-party verified in conformance with ISO 14025 and within their five-year period of validity. EPDs must be product and plant specific. Concrete EPDs are readily available throughout Oregon.

- 2) If projects are using more than one concrete mix, and certain mixes are not 10% below the regional benchmarks, they can use a weighted average approach to compliance as outlined below:

Use the following equation to calculate the average global warming potential benchmark for the project. This benchmark will be weighted by the volumes of each strength class used.

$$GWP_{AVG\ BENCHMARK} = \frac{\sum_{i=1}^n [GWP_{i\ BENCHMARK} \times Volume_i]}{\sum_{i=1}^n Volume_i}$$

Where:

$GWP_{i\ BENCHMARK}$  = benchmark global warming potential for concrete class i

$Volume_i$  = volume of concrete for concrete class i

n = total number of classes of concrete

Use the following equation to calculate the average global warming potential of the mixes proposed for the project. Include a web link to all mix EPDs used on the project.

$$GWP_{AVG\ PROPOSED} = \frac{\sum_{i=1}^n [GWP_{i\ PROPOSED} \times Volume_i]}{\sum_{i=1}^n Volume_i}$$

Where:

$GWP_{i\ PROPOSED}$  = global warming potential for proposed mix i

$Volume_i$  = volume of concrete for proposed mix i

n = total number of proposed mixes of concrete

Calculate the percent reduction in weighted average Proposed Mix GWP as compared to the weighted average Benchmark as follows:

$$\% \text{ Reduction} = \frac{GWP_{AVG\ BASELINE} - GWP_{AVG\ PROPOSED}}{GWP_{AVG\ BASELINE}} \times 100$$

For more information about CWSRF project assistance, contact your regional [project officer](#).

For questions about [low carbon concrete](#), visit DEQ Materials Management online.

## Alternate formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email [deqinfo@deq.state.or.us](mailto:deqinfo@deq.state.or.us)