



Attachment 02

## **About OpenFisca**

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## Background

[OpenFisca](#) is an open source [rules as code](#) (RaC) platform that can be used to encode and serve legislation and regulation as code. OpenFisca was initially developed by the French government in 2011, and is now used for RaC projects in France, New Zealand, Australia, Canada and other jurisdictions.

By transforming government legislation and regulation into machine readable code, OpenFisca can be used to:

- Evaluate the eligibility of individuals, households or businesses to government entitlements
- Calculate the entitlement amounts based on specific circumstances
- Determine obligations of individuals, households or businesses to comply with government policy
- Simulate the impact of proposed policy changes on different population segments

Taxes and benefits can be calculated for different entities: persons, household, companies, etc.

OpenFisca is free software, licensed under an [AGPL license](#).

## Why OpenFisca?

Being an open source platform with Web API endpoints provides OpenFisca considerable advantages over proprietary solutions. OpenFisca has also been used in several government projects, both here in Australia and around the world. Therefore, there is an existing user and support network.

Implementing Australian legislation and regulations as rules in an open repository will have many benefits.

While the most obvious use case is individuals testing their eligibility for specific entitlements via departmental websites (ie. powered by the GovCMS platform), agencies can provide additional, personalised services and content for citizens.

For example, based on user input for a specific eligibility test, OpenFisca can be used to find other entitlements the user may be eligible for. And these entitlements do not have to be limited to be within the same department or agency.

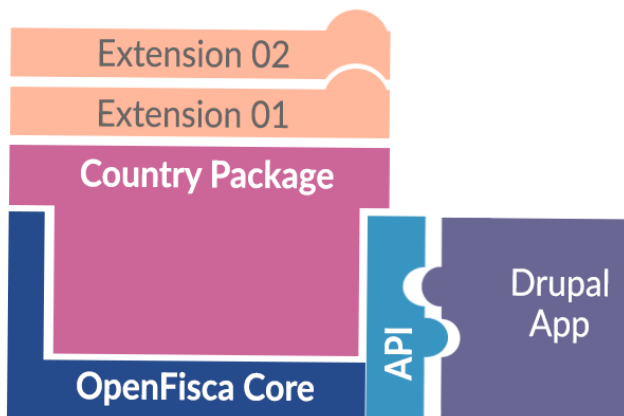
Additionally, the open repository of legislation as code can be used by government departments and industry to provide other services and automate processes. For example, departments can use OpenFisca to test the impact of policy changes across different segments of the population.

## OpenFisca components

OpenFisca is a lightweight, modular and scalable python-based rules engine. The rules engine is independent of the country or jurisdiction, so can be used to encode legislation of any country / jurisdiction / department.

OpenFisca's modules consist of:

- OpenFisca Core
- Web API
- Country Package
- Extension Package



Depending on the implementation requirements, one or several OpenFisca components will be required.

### OpenFisca Core

The OpenFisca Core is the main rules engine, and is common to all country packages. The core binds the Country Package, Extensions and the rules engine together.

OpenFisca Core also packages the Web API.

### Web API

OpenFisca exposes its rules engine via API endpoints. The API is compatible with all country packages.

The API can be used to run simulations and retrieve calculations for specific situations (including eligibility checks and entitlement amounts).

The API also provides access to the legislation [Parameters](#) and [Variables](#).

## Country Packages

Country packages are the basic modules of OpenFisca and define the Parameters, Entities and Variables for a country.

## Extensions

Extensions extend the capabilities of the country packages and are used to define new variables or parameters. Extensions are typically used to implement tax and benefit rules for local jurisdictions and departments (eg. States and Territories, local governments and departments/agencies)

## Case Studies

### Salsa, GovZero Aotearoa and OpenFisca

Gov Zero Aotearoa is an open source, citizen led initiative that aims to address a number of challenges facing the citizens and government of New Zealand. A key outcome of the project is to create a public commons of legislation and regulation as code (RaC) using OpenFisca.

The RaC project aims to create an open source repository of legislation and regulation as code, starting with high value use cases. The repository will provide open digital infrastructure that can be used and leveraged by anyone. The RaC repository will make it easier for citizens to access legal rights and understand their eligibility for benefits and their regulatory obligations.

A team of three senior Salsarians are currently working on the GovZero Aotearoa Rules as Code (RaC) project, codifying New Zealand's [Social Security Act of 2018](#). The team is currently creating a logical map of the legislation, identifying the prescriptive rules, thresholds and subjective clauses. The legislation will be then encoded using OpenFisca.

The Salsa team collaborates closely with a diverse group of experts. The wider group has considerable experience with Rules as Code and OpenFisca, with many members having previously worked on RaC / OpenFisca projects in both New Zealand and New South Wales (see examples below).

For more information about GovZero Aotearoa and Salsa's contribution, please refer to *Attachment 0X - About GovZero*. Also see *Attachment 0X - Gov Zero Aotearoa - introduction pack*.

### Examples of OpenFisca implementations

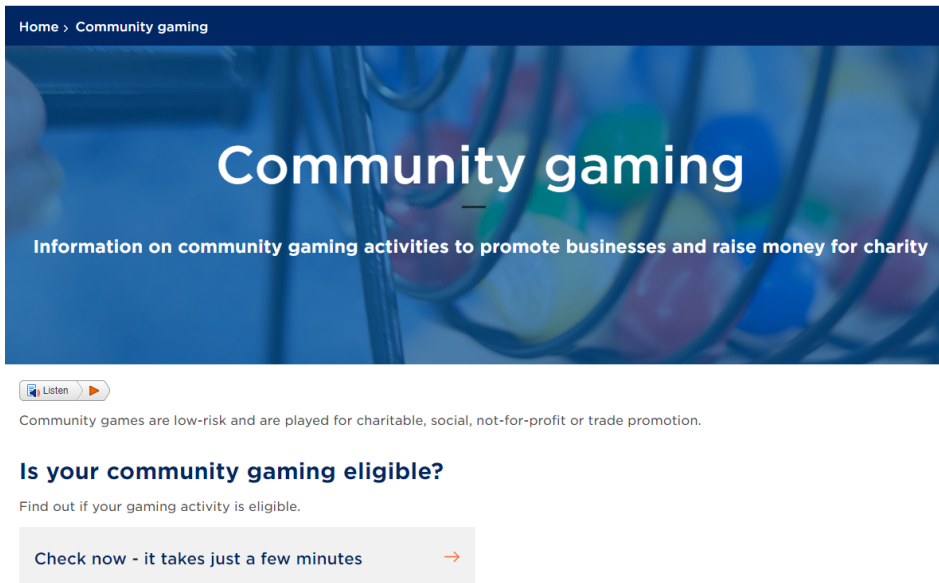
#### Fair Trading New South Wales

<https://www.fairtrading.nsw.gov.au/community-gaming/community-gaming-regulation-check>

In Australia, the New South Wales [Policy Lab](#) and the [Digital.NSW Accelerator \(DNA\) Lab](#) have experimented with Rules as Code and have developed a simple eligibility checker using OpenFisca as a [prototype](#).

After proving the viability of the concept, the Fair Trading New South Wales [implemented](#) a simple OpenFisca rules engine to allow citizens to check whether they are allowed to conduct gaming activities.

The interface asks a series of questions – with the questions dependent on the type of game citizens are planning to run. Based on the inputs (answers), OpenFisca returns whether the citizens are allowed to run their gaming activity.



Another example of a rules as code implementation in Australia is AUSTRAC's [eligibility checker](#) to determine whether you need to enrol or register to comply with Australia's anti-money laundering and counter-terrorism financing law.

## France

Many governments around the world are exploring and implementing RaC, but France was an early adopter and innovator. The French government has integrated several OpenFisca projects with departmental websites.

### Mes Aides (My Helpers) – Entitlements eligibility simulator

<https://mes-aides.gouv.fr/>

Mes Aides uses OpenFisca and its Web API to inform French citizens on their eligibility to national and local benefits. The portal provides access to two simulators:

1. <https://www.1jeune1solution.gouv.fr/>: For under 30-year-olds, the site allows users to check the eligibility for more than 500 entitlements.
2. <https://www.mesdroitssociaux.gouv.fr/>: For all citizens to evaluate their eligibility for almost 60 entitlements.

The OpenFisca powered eligibility simulator compares an individual's personal situation to French social security legislation eligibility criteria, and informs users whether they are entitled to payments or not. Additionally, the OpenFisca engine can calculate the amount of payments citizens are entitled to and any conditions or obligations they must meet.

Users are guided through a series of questions served through web forms. Alternatively, users can login, which will pre-populate known data.

## Lex Impact – Policy difference engine

<https://leximpact.an.fr/>

The “Lex Impact” service allows users to test the impact of policy changes. Users can test changes to the following policies/legislation:

1. Income tax
2. Grants to municipalities
3. Social contributions and benefits
4. Social security revenue

For each of the policies, there are test cases and various policy variables that can be modified to see the impact. Users can also add specific test cases.

For example, for the income tax simulator, users are presented with various input values that can be changed (eg. income thresholds and tax rates), and also different household types. By changing the values, users can see the impact on different households. Users can also add different household types (eg. single parent with three dependent children) to see specific impacts.

## Barcelona, Spain

### Les meves ajudes (My Aides) – Entitlements eligibility simulator

<https://ajuntament.barcelona.cat/lesmevesajudes/>

Similar to the French Mes Aides service, les meves ajudes allows users to test what benefits they are eligible for. The eligibility service incorporates social security legislation from the city of Barcelona, the government of Catalonia and the state.

Users use a form to provide their specific circumstances and see what social benefits they are entitled to. OpenFisca is used to return what benefits citizens are entitled to, the amount and links to how to apply.

## New Zealand

### Rapu Ture - Exploring the Rules

<http://nz.openfisca.org/>

Regionally, the New Zealand government has led the way in terms of experimenting with OpenFisca and encoding legislation as code.

The [Service Innovation Lab](#) not only looked at simple encoding of rules, but also explored best practices for transforming government legislation into machine readable code.



The Rapu Ture portal is an experimental project by the Service Innovation Lab to model, explore and evaluate government rules. The site contains many scenarios for users to explore, with both test inputs and expected outputs.

The New Zealand government have used rules as code in creating [SmartStart](#), a portal for NZ parents that includes birth registration.