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Assessment of the impact of financial and fiscal incentives for the development of utility-scale solar energy projects in northern Chile

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Abstract

Solar resource in northern Chile is among the highest in the world, and economy pivots around mining industries [1], which have an intensive consumption of heat, electricity and water. Electricity supply is strongly based on coal and the common source for heat is diesel [2]. While PV can provide electricity at a near competitive price in most markets, CSP is seen as more suitable for utility-scale projects, so both technologies are considered for electricity supply. A base case has been defined for each technology, with investment, operation, fiscal and financial costs as close as possible to the reality of the solar sector in Chile. Five different taxes have been detected to apply to Non-Conventional Renewable Energy (ERNC) projects, such as Customs Duty, Value-Added Tax (VAT), Corporate Tax, Municipal Tax and Additional Tax for Expatriated Revenues. The effect of these taxes on the final price of electricity required to make the project economically feasible has been determined. Sensitivity to exemptions and incentives, both existing and proposed, has been studied, and the efficiency of such measures, in terms of price reduction vs. taxes not collected, has been estimated. The Chilean state and/or Multilateral Development Banks can channel aids from Clean Technology Funds or Official Development Assistances to incentive solar projects through different products such as Soft Loans and Partial Credit Guaranties. The effect of these aids on the final price of electricity required to make the project economically feasible has been determined, and sensitivities have been studied.

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Keywords: solar, PV, CSP, Chile, policies, incentives

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1. Introduction: economic environment and tax structure in northern Chile

The activities that encompass mining in northern Chile grow an average 5 % annually, and require large volumes of electricity, heat and water. In Chile, energy dependence on imported fossil fuel is equal to 68 % of gross primary energy consumption. Also, 56.5 % of the electricity generated comes from fossil fuels [3], yet the increase in fossil fuel prices, agreements for reducing emissions and requirements in the environmental regulations have fostered a push for solar to be the primary energy source for conversion into electrical and thermal energy. These technologies offer greater energy independence, price stability and lower emissions. Fiscal and financial incentives can help the promoters to reduce the final price of electricity required to make Non-Conventional Renewable Energy (ERNC), and particularly solar, projects economically feasible, and contribute to the quick and steady development of said projects.

Regarding the tax structure, five different taxes have been detected to apply to ERNC projects:

The Customs Duty or “Impuesto al Comercio Exterior” (CE) is an indirect tax levied on imports. The tariff is calculated as a 6 % of the result of adding the cost of goods, insurance premium and freight value. Several countries have signed bilateral commerce treaties with Chile which include partial or total exemptions from this tax [4].

The Value-Added Tax or “Impuesto al Valor Agregado” (IVA) is an indirect tax levied on consumption. Companies act as collectors of this tax, balancing the amounts paid and charged on this concept with the government. The rate of this tax is 19 % [5].

The Corporate Tax or “Impuesto a las Utilidades” (IU) is a direct tax levied on the income earned by commercial, industrial, mining and service companies. It is applied on the basis of the net profits earned by the company. The rate of this tax is 20 % [5].

The Municipal Tax or “Impuesto de Patente Comercial” (PC) is a direct tax levied by municipalities on companies that develop commercial or industrial activities in their territory. The yearly amount is calculated on the basis of the equity capital of the company, and the rate ranges between 0.25 and 0.50 %, at the municipality’s discretion [5]. It is limited to 8,000 UTM/year where UTM stands for “Unidad Tributaria Mensual”, a figure in Chilean tax law which value changes monthly according to the Consumer Price Index. It has ranged between 40,005 and 40,286 CLP (Chilean pesos) during the first half of 2013 [6].

The Additional Tax or “Impuesto Adicional” (IA) is a direct tax levied on the same basis as the Corporate Tax, but it applies to income obtained in Chile by individuals or legal entities neither domiciled nor resident in Chile, when this income is sent abroad. The rate of this tax is 35%, but the amounts already paid on the same basis (e.g. Corporate Tax) are deducted [5].

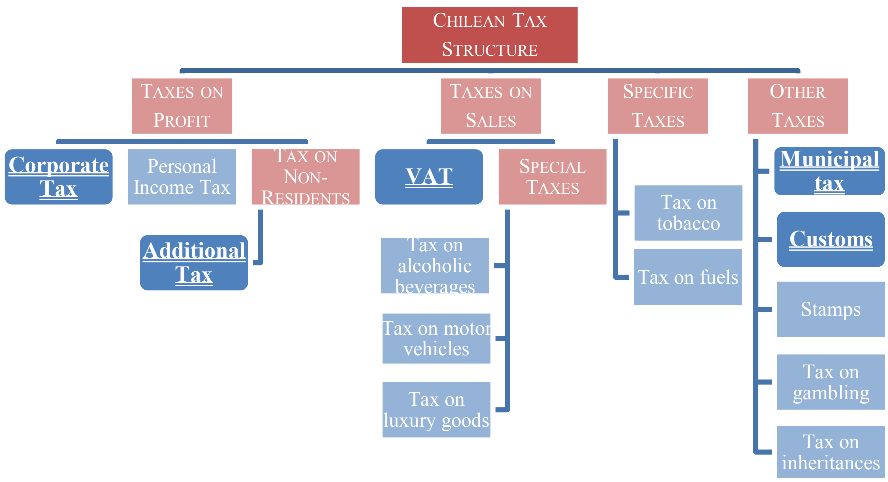

Fig. 1. Chilean tax structure, with taxes applying to ERNC projects highlighted