

## Case of e-charging infrastructure in the Netherlands

The case of the e-charging infrastructure in the Netherlands is a very interesting one, the Netherlands has one of the densest charging infrastructures worldwide. The policy of the Dutch government is very much oriented towards the *market model*: the stimulation of profitable business models. Public parking facilities are only provided if necessary, this e-charging infrastructure should be mainly developed on private premises, home facilities or semi-public parking facilities like parking lots of shopping malls or restaurants.

## Important notions and concepts of institutional economic theories

### 1. Assumptions about human behaviour

- Institutional economics assumes that *actors are bounded rational*, so decisions are based on incomplete and asymmetric information. Actors do not have complete information about what happened in the past or what will happen in the future. There might also be actors that have more information than others, so the information is asymmetric and incomplete.
- Actors have to be aware that *third parties might develop opportunistic behaviour*. So if there is an opportunity, actors might try to gain more profit at the expense of others, and if we analyse activities between actors we have to take these characteristics into consideration.

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Under these conditions optimization of solutions is not possible. We do not have complete information and we do have to take care of opportunistic behaviour.



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The only thing actors could do is developing *satisfying behaviour*. They might have certain expectations and these expectations might be satisfied or not. Therefore, institutional economic approach really applies assumptions that are more in line with what we see in reality.

### 2. Transactions and transaction costs

Transactions can be defined as the legal transfer of ownership and decision rights as determined by the involved parties. So transaction is not primarily about transferring certain goods between actors, but transactions are about transferring certain *ownership and decision rights*, so going back again to the example of building e-charging facilities on a parking lot of a restaurant or a shopping mall, a transaction would be the transfer of certain ownership rights and decision rights with respect to the use of this parking lot for building and operating e-charging facilities.

These transactions do not only depend on the economic scarcity of e-charging facilities, but it also depends on *rules and laws*, so it depends on what kind of transaction, what kind of agreements are made between the parties under what conditions these e-charging facilities can be built and operated. These transactions incur certain costs that we call *transaction costs*. Before actors are able to come to an agreement with owners of a parking lot for instance, these operators of e-charging facilities need to search for certain premises and they need to gain information where these e-charging facilities could be usefully installed or not, and these are called *search and information costs* and these costs can be quite substantial.



And finally, once these e-charging facilities are installed and operated on a certain spot, one needs to monitor and enforce the agreements made. We need to make sure that both contracting parties live up to what they promised in their contracts, and this is also associated with cost, they are so called *monitoring and enforcement costs*, and these transaction costs can be really substantial as you can imagine. These transactions just have to be constructed and they have to be negotiated and they have to be monitored and enforced and some substantial transaction costs are involved in this.

### 3. Notion of institutions

How to coordinate these transactions efficiently? How to not only minimize the production costs of building and operating these e-charging facilities, but also the transaction costs? They are strongly determined by different *institutional arrangements*. And that brings us to the notion of institutions. A very popular definition of institutions is provided by Jeff Hodgson in 2006, he defines institutions as "systems of established and prevalent social rules that structure social interaction." So institutional economics really labels institutions as social rules, and these social rules are important to structure social interaction.

## Why is that the case?

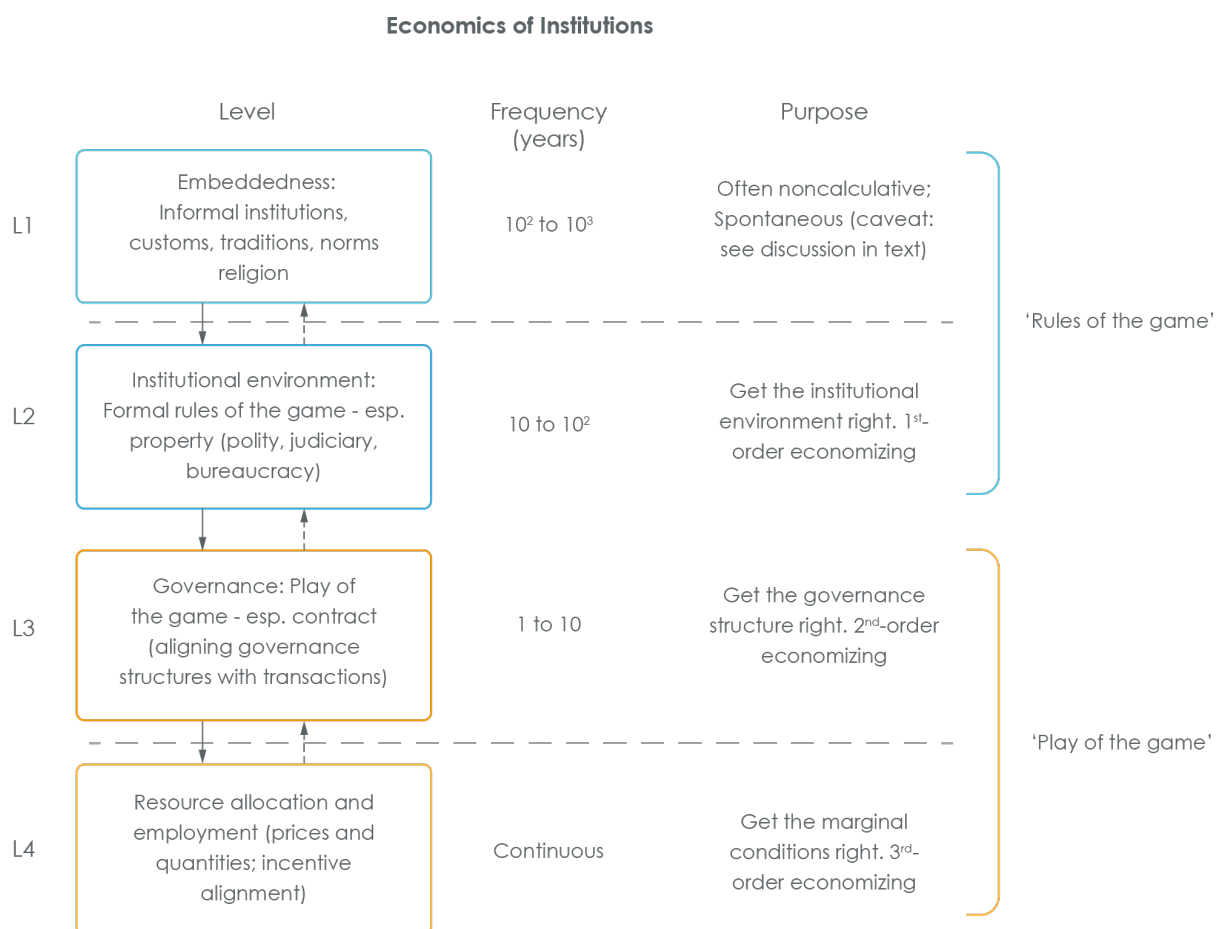
If you would build e-charging facilities on the parking lot of a shopping mall or a restaurant, you need to make sure that your contracting partner really lives up to what you agreed in advance. For that we would need some laws and regulations, or we need certain contracts. And without these kinds of reasonable expectations we would never invest in these e-charging facilities, because one couldn't be sure what



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the contracting partner would do in the future. So, in that respect institutions are really fundamental for establishing these kinds of transactions.

## Different categories of institutions



So, to conclude, institutions do matter. Institutions determine the rules of the game and we have to be aware of these rules of the game, these informal and formal rules, if we would like to develop these e-charging infrastructures. Institutions also determine the play of the game with respect to the contractual arrangements between the provider of e-charging facilities and the owner of parking lots of shopping malls or restaurants.

