

## SYNTHESIS « MOTORS AND PERSPECTIVES »

The new PRBC and POGDC concepts are new architectures of internal combustion engine (convertible into pumps), *coming from a long analysis of the "current motor problematics" wishing to be the most objective and exhaustive that possible*. From this analysis, priority functions to assure cleared themselves :

1. *To encourage the compactness*
2. *To permit an appropriate maximal power*
3. *To make vary the output power by sufficiently small steps*
4. *To use a 4 times cycle with fast transition between the BDC / TDC*
5. *To permit a high liberty of variable wedging for the valves*
6. *To use some technologies solely having given their proofs*
7. *To make continuously vary the volumetric ratio*
8. *To have a perfectly and intrinsically well balanced engine*

The function n°1 allows **the proposed motors to be at least 4 times more compact to equal power that the present motors with pistons, rod and crank**. It allows them *to promote all present efforts of hybridization, notably to go toward structures" FULL hybrid"* :

- by the gain of place that the batteries will be able to occupy
- thanks to the power offered by the thermal engine, small but nevertheless powerful.

The function n°2 is a simple requirement of power on the motor, that has been fixed to 70 Hp. *to motorize a typical citycar, in the mind of an electric complement of 30 Hp, appropriately. to have a full-hybrid structure with a total power of 100 Hp.*

The function n°3 aims **to exploit the motor in partial powers by the deactivation of combustion rooms, so that the rooms remained active function to full load, and therefore on an optimal thermodynamic output**

The function n°4 aims **to pilot completely the volumetric behaviour of the rooms according to the angle of rotation of the output shaft**, in order to facilitate the new ways of combustion, or even spontaneous bang (CAI, HCCI). The PRBC and POGDC concepts permit an arbitrary evolution of the kinematics of the mobile parts. By generating a programmed pressure rise, one can control the inflammation as well that the moment of ignition of the bang.

The function n°5 concerns *the management of the intake and exhaust of gases*. It aims **to achieve the total liberty of variable wedging in phase and in opening, but also the possibility to block a valve in position** to leave a room closed in order to disactivate it temporarily.

This option, combined to the high compactness permits **to dedicate some rooms to currently impracticable functions** even as :

- the regenerative braking with pneumatic storage (rooms converted in compressor during the the braking and in air motor during the following acceleration),
- *Recuperation of heat of the exhaust gases by a combined cycle, for example Diesel / Steam or Otto / Steam based on an injection of water, for example.*

The function n°6 has for goal **to make the SYCOMOREEN motors compatible with the present industrial manufacturing structures** of motors and various parts.

The function n°7 aims **the downsizing by regulation of the compression ratio, but also the improvement of the combustion output**, and therefore the reduction of consumption.

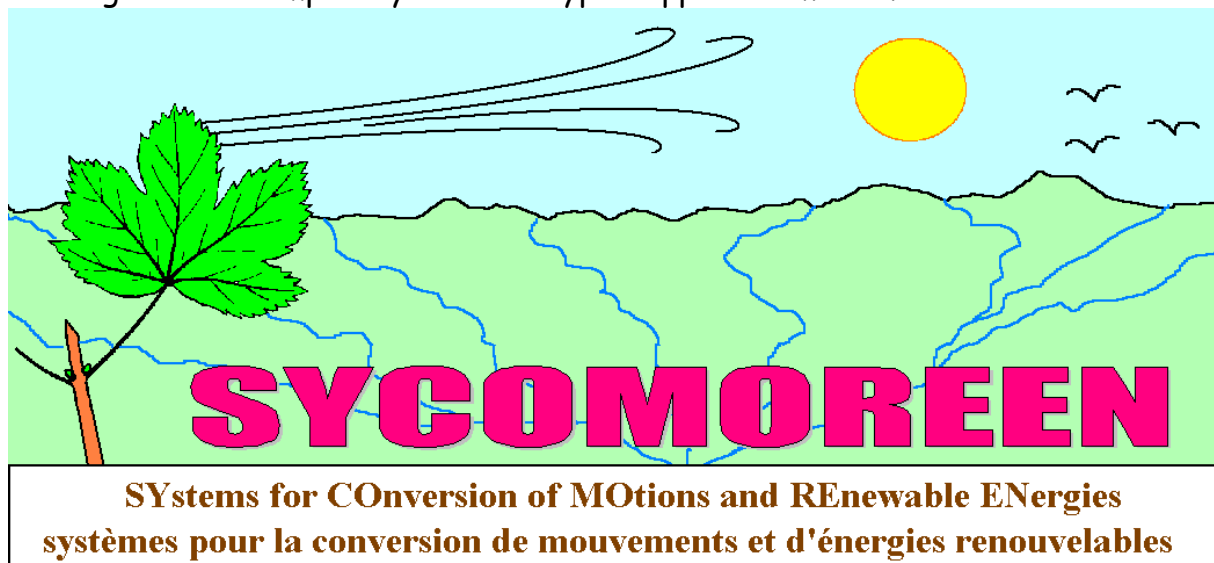
*The downsizing reached by the SYCOMOREEN's motors, especially with the use of [central rotary overmultilobed cams](#), is so important that it will permit to modify the architecture of the vehicle, for example :*

- One motor by wheel, one electrical axle and the other one thermal powered
- Or a flat floor on the set of the surface of the vehicle.
- Imagination without limits of the future designers !

The function n°8 imposes a kinematics not generating vibrations, **suppressing the losses bound to their amortization via silent-block or shock absorbers, and increasing the comfort and the stability of the vehicle.**

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To summarize, all these perspectives are coming from a multitude of recent and various progress that the SYCOMOREEN concepts regroup harmoniously on only one engine with completely new and hypersupple kinematics.



**THE NATURALLY ENERGETIC MOVEMENT !**

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