Assuming at least s processors on a parallel computer, the local cost on the ith processor of computing the matrix-vector product Ku consists essentially of:

- one matrix-vector product with matrix M;
- one matrix-vector product with matrix J;
- some communication with other processors according to the nonzero coefficients of the ith row of matrix TAT^{-1}.

The local cost on the ith processor of computing the matrix-vector product Qv consists essentially of:

- one decomposition of matrix H_i;
- solving two linear systems with the decomposed matrix H_i;
- one matrix-vector product with matrix M;
- one matrix-vector product with matrix J;
- some communication with other processors according to the nonzero coefficients of the ith row of matrix Ω.

Remark: When $\gamma_i = \gamma$ is the same value for $i = 1, \ldots, n$ we can express

$$H = I_s \otimes (M - h\gamma J), \qquad G = \left(I_s - \frac{1}{\gamma}\Omega\right) \otimes M + \frac{1}{\gamma}\Omega \otimes (M - h\gamma J),$$

hence we obtain

$$Q = H^{-1}GH^{-1} = H^{-1}\left(\left(\left(I_s - \frac{1}{\gamma}\Omega\right) \otimes M\right) H^{-1} + \frac{1}{\gamma}\Omega \otimes I_n\right)$$

and the matrix-vector products with matrix J are not needed anymore in the computation of the matrix-vector product Qv.